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CONTENTS.

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

AN ADDRESS on the Efficiency of Man and the Factors which Influence it. By Prof. E. P. CATHCART, M.D., D.Sc., F.R.S. 547

A LECTURE on Rickets, Marasmus, and Scurvy. By J. H. THURSFIELD, M.D., F.R.C.P. 551

ORIGINAL ARTICLES.

The Pelvic Appendix. By Prof. RUTHERFORD MORISON, M.D., F.R.C.S. 553

Salivary Glands in Carcinoma. By Prof. L. S. DUDGEON, C.M.G., F.R.C.P., and P. H. MITCHINER, M.D., M.S., F.R.C.S. 558

Periodic Alkalæmia with Alkalosis in the Adult. By WILLIAM MACADAM, M.D., M.R.C.P., and JOHN GORDON, M.B. .. 560

The Scope of Vaccine Therapy. By C. E. JENKINS, M.R.C.S..... 563

REVIEWS AND NOTICES OF BOOKS.

The Heart as a Power Chamber. By Harrington Sainsbury, M.D., F.R.C.P. 565

Infant Mortality. Second edition. By Hugh T. Ashby, M.D. 565

The Thyroid Gland. Clinic of George W. Crile and Associates. Edited by Amy F. Rowland..... 565

Collected Papers. Institute of Physiology, University College, London. Vol. XX. Edited by E. H. Starling, M.D., F.R.S.; W. M. Bayliss, F.R.S.; and J. C. Drummond, D.Sc. 565

The Tuberculosis Clinic. Edited by Noel D. Bardswell, M.D., F.R.C.P. 566

Juvenile Delinquency. By H. H. Goddard..... 566

American Illustrated Medical Dictionary. Eleventh edition. By W. A. Newman Dorland, A.M., M.D..... 566

Psychology and Mental Hygiene for Nurses. By Mary B. Eyre, R.N..... 566

The Middle Game in Chess. By Eugene Znosko-Borovsky 567

British Journal of Children's Diseases 567

Indian Journal of Medical Research 567

BRITISH MEDICAL ASSOCIATION.

Annual Meeting at Glasgow. Section of Otology: Septic Sinus Thrombosis; its Diagnosis and Treatment.—Benign Forms of Otogenic Meningitis 568

Section of Laryngology: Diseases of the Œsophagus: their Symptomatology and Differential Diagnosis.—Use of Radium in Malignant Disease of the Larynx and Œsophagus 569

Section of Dermatology: Ætiology of Seborrhœa.—Industrial Dermatitis. 570

Section of Diseases of Children: Tuberculosis of the Cervical Glands.. 571

Section of Anatomy: Relation of the Ureters to the Vagina..... 572

LEADING ARTICLES.

BODY AND MIND..... 573

TREATMENT OF NEURO-SYPHILIS BY ARTIFICIAL LEUCOCYTOSIS 573

HIGH ALTITUDES AND WANT OF OXYGEN 574

THE PRINCE OF BEGGARS.. 575

ANNOTATIONS.

Certifying Factory Surgeons 575

The Association of a Spinal Disease with Hunger Osteomalacia 575

The Boarding-out of Lunatics in Scotland .. 576

The Cercarial Fauna of India 577

The Future of the Tuberculosis Colony 577

Ventilation of Debating Chambers 578

Potassium Permanganate in Dermatology 578

Carl Thiersch..... 579

The Prevalence of Notifiable Diseases..... 579

The Food Poisoning at Loch Maree 579

SPECIAL ARTICLES.

Tuberculosis: Chemotherapy in Tuberculosis 580

Health Resorts Abroad: I. Assouan. II. Bagnoles-de-l'Orne 580

Vienna: Vienna Institute for Home Nursing..... 581

PUBLIC HEALTH SERVICES.

Insurance Practice and Lock-up Surgeries.—Notification of Infectious Disease by Teachers.... 582

Reports of M.O.H.'s: Kensington.—Hampstead.—Hackney.—Holborn.—Bethnal Green.—Poplar.—Edmonton.—Finchley.—Hendon.—Tottenham.—Beckenham.—Croydon.. 583

School Medical Service: North Riding of Yorkshire.—Norfolk.—Northamptonshire.—Rutland.—Kent 584

Asylum Medical Service... 585

CORRESPONDENCE.

Clayden *v.* Wood-Hill (Dr. H. Wood-Hill)..... 586

Sanatorium Benefit (Dr. James D. Macfie)..... 586

Pay in the Navy..... 587

Clinic Experience in Contraception (Dr. Norman Haire, Dr. Marie C. Stopes, Miss Ettie A. Rout) 588

Some Exemption for the Professional Car..... 589

THE SERVICES.

Royal Naval Medical Service.—Royal Army Medical Corps.—Royal Air Force.—Indian Medical Service.—Deaths in the Services..... 589

OBITUARY.

Stephen Smith, M.D.—(*With portrait*) 590

James Donelan, M.B., M.Ch. 590

David Sharp, M.A., M.B., F.R.S. 590

MEDICAL NEWS.

Pasteur Commemoration Fund 591

Fairchild Scholarship and Prizes 591

Donations and Bequests.. 572

Measles Epidemic in Manchester 575

End of Small-pox Epidemic in Colne Valley..... 575

Royal Institute of Public Health..... 582

Wallasey: Salary of M.O.H. 589

Manchester's New M.O.H.. 591

Serbian Medical Society... 591

City Charity Athletic Contest 591

Boxing in the Navy..... 591

Royal Sanitary Institute.. 591

Small-pox at Bentley..... 592

North-East London Clinical Society 592

The late Dr. Joseph Carroll 592

Radcliffe Infirmary, Oxford: Post-graduate Course... 592

National Milk Conference in London 592

Hospital Reunion..... 592

The Junior Red Cross..... 592

NOTES, SHORT COMMENTS, &c.

The Welfare of the Blind.. 593

The Cinéojour 594

Social Legislation in Czecho-Slovakia 594

The Homes for Inebriates Association 594

An Improved Aero-Urethroscope 594

Oipenapneu Treatment.... 594

Salary Standards for Health Officers in the United States 594

Appointments 592

Vacancies 592

Births, Marriages, Deaths.. 593

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ON THE

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AND THE FACTORS WHICH INFLUENCE IT.

Presidential Address delivered to the Section of Physiology of the British Association at Hull on Sept. 8th, 1922,

BY E. P. CATHCART, M.D., D.SC. GLASG., F.R.S.,
GARDINER PROFESSOR OF PHYSIOLOGICAL CHEMISTRY, UNIVERSITY OF GLASGOW.

THE subject of my address—the efficiency of the human organism and the factors which influence this efficiency—is, in my opinion, one of the most important problems of the present day. It is a problem which cannot receive adequate consideration from its physiological aspect only; its implications are much wider, reaching down to the very basis of our daily lives. As I am no expert in industry or economics, I shall confine my attention as far as possible to the physiological side, and leave to others the sociological application.

The term "efficiency" has become a mere catch-word, bandied about by people who have not the faintest idea of what the word connotes. Practically it has come to mean, to the man in the street, the mythical improvement to be anticipated from some change in workshop or office organisation—a bigger and better result at a smaller cost. The word has a very definite meaning in engineering science, and this meaning has been transferred from the inanimate machine to the living organism. In the case of the engine the problem is relatively simple, as the number of interfering factors is not great, but the solution of the problem in the case of the organism is beset with many difficulties, as the interfering factors are numerous and varied. Two types of efficiency are spoken of in connexion with the animal body. One type is the mechanical efficiency in the engineering sense—i.e., the ratio which exists between the heat equivalent of the external muscle work done and the energy output of the subject during the performance of the work in question. This problem has attracted many workers, and there seems to be a general consensus of opinion that the efficiency of man in the performance of external work is about 20 per cent. gross and 25 per cent. net. (*Gross* efficiency is obtained by dividing the actual heat equivalent of the external work done by the total output of energy of the man during the time occupied in the performance of the external work, and *net* efficiency is obtained by dividing the heat equivalent of the external muscle work done by the actual increase in the energy output of the subject over the basal energy output during the performance of the work in question.) As A. V. Hill has pointed out, this striking unanimity is probably due to the fact that the maximum value of efficiency remains more or less constant over a fairly wide variation in the mode of the performance of the work. The work referred to here is wholly concerned with muscle activity. In the other type, industrial or productive efficiency, the capacity of the individual to perform effective work is dealt with, judged, for example, by his output in unit time. So far as the worker is concerned, the whole object in industrial efficiency is undoubtedly to get the greatest output with the minimum of effort. The determination of mechanical efficiency is fairly readily carried out, but it is very difficult to get an accurate gauge of industrial efficiency. At bottom they are closely related, and both are physiological problems.

The leaders of industry have not been slow to utilise the gains of science in the realm of inanimate things, but they have been slow to recognise the fact that there is a science of physiology which deals with the man who controls the productive machinery. New inventions may completely revolutionise shop equipment, but physiological evolution is infinitely slow. As Lee puts it, "Try as we will we cannot get away from the fact that so long as machines need men, physiological laws must be reckoned with as a factor in industrialism."

EFFECTS OF THE INDUSTRIAL REVOLUTION.

It is little more than a hundred years since this country was industrialised, and we are still reaping the aftermath of the terrible conditions which then reigned, when the country dwellers poured into the towns in the race for wealth. The following citation from Robert Owen gives a good idea of the conditions ruling in the early years of last century in one of our staple industries:—

> In the manufacturing districts it is common for parents to send their children of both sexes at 7 or 8 years of age, in winter as well as summer, at 6 o'clock in the morning, sometimes, of course, in the dark, and occasionally amidst frost and snow, to enter the manufactories which are often heated to a high temperature, and contain an atmosphere far from being the most favourable to human life, and in which all those employed in them very frequently continue until 12 o'clock at noon, when an hour is allowed for dinner, after which they return to remain, in a majority of cases, till 8 o'clock at night.

Six till eight, with a break of one hour; a 14 hours' day, and 15 was not unknown. Owen, in the article from which I have quoted, was petitioning Parliament for a 12 hours' day, to include one and a half hours for meals, and for no employment of children under the age of 10. He pointed out in the course of the article that the results from the manufacturers' point of view would be better with a 12 hours' day (i.e., that the industrial efficiency, in modern words, would be improved).

Yet we wonder that the offspring of stock descended from workers under these conditions, which certainly improved as the century advanced but were far from ideal, gave the high yield of C 3 lads recorded in the National Service Report. We might have been prepared for the disclosure, as the pre-war records of countries with conscription showed that the number of rejections for the army of town and factory workers was far in excess of those for men drawn from country districts. But evidence of the state of the national physique is not confined to these war figures. Sir George Newman, in his valuable and interesting report on Preventive Medicine, has drawn attention to the enormous amount of time which is annually lost through sickness. The minimum average amounted to 14,295,724 weeks (or a period of upwards of 270,000 [1] years) of sickness per annum, and this figure did not include absence from work due to maternity benefit, sanatorium treatment, or absence for less than four days per patient. This is the evidence of the National Health Insurance.

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TABLE I.

Nature of work.	Duration of work.	Effective muscular work per min.	
		Kgm.	Calories.
Mountain climbing—			
Moderate	Many hrs.	500	1·16
Severe	1 to 2 hrs.	750–1000	1·74–2·33
Very severe	3–75 min.	2000	4·65
Treadmill	30 secs.	2400–3600	5·58–8·37
Running upstairs—			
10 kg. load	15 ,,	3700	8·61
No load	30 ,,	4300	10·00
,, ...	4 ,,	5700–6000	13·26–13·95

Kgm. = kilogrammetres.

[1] Latest Health Insurance figures are 14,476,074 weeks, upwards of 278,000 years.

If in the human organism we were merely concerned with the coördinated action of a series of effectors, with the capacity of a certain group of muscles to perform a given amount of work, the solution of the problem would be relatively simple. But we are dealing with a living organism capable of repairing worn-out parts, as and when required, and varying not only in capacity to perform work, but in "will to work." This organism has a whole series of protective mechanisms at its command, and one day it may be fatigued and rendered useless as a working unit by an amount of work which on another day it can perform without apparent fatigue. It can and does perform hard muscular work with vigour and joy; yet, if the employment or the environment be distasteful, it can be reduced to impotence by work capable of being done by a child. Again, the efficiency of a man is not merely dependent on the amount of work which can be performed by his muscles; the circulatory, respiratory, and nervous systems are of equal importance, and all are intimately related. There must also be proper coördination between the various groups of muscles. A man does not walk, for instance, by the aid of his leg muscles alone; his lumbar muscles are equally important. Further, it is not a mere question of autonomic reflex adjustment, important though this may be; for much of the work done the attention must also be invoked. Yet, in spite of the many stresses and strains of life, unless overloading is excessive, too frequent or too long continued, the organism, so long as it remains physiological, is practically unaffected by ordinary hard work.

FATIGUE.

If we turn now to the consideration of the factors which influence both mechanical and industrial efficiency, we find that the main controlling factor is fatigue. Fatigue is a word as frequently used as efficiency, and yet it is almost impossible to give an accurate definition of the term. Generally speaking, it is to be regarded as the antithesis of efficiency. As Vernon put it, "By so much as fatigue is avoided or eliminated in industrial operations the efficiency of the worker is increased." Fatigue may be summarised as a diminished capacity for doing work. The question of the site at which fatigue is first manifested, whether it is a central or a peripheral phenomenon, whether it is a specific condition, or whether, as Crile maintains, there is no ultimate difference between the bloodless intangible causes of fatigue and exhaustion and the bloody tangible causes of "shock," lies without the scope of this address. No one has as yet devised a method which permits of a quantitative determination of the degree of fatigue, and some workers, Muscio for example, have definitely stated that such a test is an impossibility. The study of metabolism has given little or no clue so far. Benedict and I carried out a certain amount of experimental work on this phase of the question. Our results show that the subject may be on the verge of absolute collapse, and yet, so far as the metabolic determination goes, with no very marked

TABLE II.

Time.	Oxygen consumption per min. in c.cm.	Rate of work revs. per min.	Net efficiency in per cent.
8.30 A.M. (start)			
9.00 ,, ...	1967	91·3	23·1
9.45 ,, ...	1946	91·4	23·3
0.30 ,, ...	1969	91·7	23·2
1.15 ,, ...	1948	90·3	23·2
12.00 noon	2003	89·0	21·7
12.45 P.M.	1899	78·2	21·3

evidence of diminished efficiency in a mechanical sense. In an experiment with a subject who, in the post-absorptive state, rode on a bicycle ergometer for nearly four and a half hours until on the verge of collapse, doing 208,000 kilogrammetres of external work during the time, the metabolism was determined six times during the riding period with the result shown in Table II.

There is, as might be expected, some slowing of the rate at which the work is done, but the diminution in the net efficiency, in spite of the fact that the subject admitted he was completely done at the conclusion of the last determination, is not striking. In other experiments where the type of muscle activity was marching, little apparent effect on the metabolic cost was noted until extraneous muscle activity was introduced in the form of staggering as the result of exhaustion.

THE ATTAINMENT OF MAXIMUM EFFICIENCY.

Obviously, then, the capacity to carry on is limited by the genesis of fatigue. But it is equally obvious in practice that a man may be engaged in strenuous labour for many hours without acute signs of impending exhaustion. There are at least four factors which, to my mind, play predominant rôles in the attainment of maximum efficiency—viz., the rate of the performance of work, the amount of rest offered or taken by the subject, the rhythm with which the work is performed, and the work habits developed by the worker. I shall attempt to examine each of these factors separately, but they are all intimately related and usually merge into one another.

Speed.

Of the four factors most attention has probably been devoted to the rate at which work is carried out. The glorification of that much misused half-truth, "Time is money," is responsible for much false physiology. Farmer, in a recent report to the Industrial Fatigue Board, laid, I think, the correct stress on the relation of speed to general industrial efficiency when he wrote:—

> "No movement can be compared with another and said to be better than it merely on account of its speed; it should only be compared in respect to ease and final result."

This is a good answer to those who believe that maximum efficiency can be best obtained by mere speeding up. Goldmark writes:—

> "Now just in proportion as this function of speed is developed, subject to the capacities of the human agent instead of as a driver of these capacities, it counts as a gain. Just so soon as the function of speed is dissociated from its effects on the worker we revert to the old system of pace-making and speeding."

These are the observations of field workers. Can they be substantiated by experimental work in the laboratory? Benedict and I found, with a carefully calibrated bicycle ergometer, that there was a very close connexion between the speed at which work was done and the mechanical efficiency. There was a very definite falling-off with increased speed, as Table III. shows. Unfortunately it was impossible to get our subject to pedal slower than 70 revolutions per minute.

TABLE III.

Revolutions per min.	Gross efficiency.	Revolutions per min.	Gross efficiency.
70	20·6	110	17·6
80	20·0	120	16·9
90	19·2	130	16·1
100	18·4	—	—

We found, further, that if the amount of effective muscular work done was kept constant, the efficiency fell with an increase of speed.

A. V. Hill has also recently dealt with this problem in a most interesting piece of work, where the activity was strictly confined to the biceps and the brachialis anticus. He demonstrated very clearly that, in spite of the fact that the slower the contraction the greater was the amount of work done, all advantage thus gained was rapidly neutralised and dissipated as the result of the slow contraction necessarily causing an increased degradation of energy in the way of physiological changes resulting from the maintenance of contraction. Thus a slow contraction, powerful though it might be, was not necessarily one of high efficiency. The actual efficiency—i.e, the ratio of the

external work done to the energy degraded in carrying it out—was found to pass through a definite maximum value as the duration of the contraction increased. The maximum efficiency in his series of experiments was 26 per cent. He found that it was very rapidly attained, the optimum for the muscles investigated being apparently just under one second, but the fall which followed, as the duration of the contraction increased, was comparatively slow. On account, therefore, of the blunt nature of the curve the efficiency remained more or less constant over a wide range of speeds.

Load.

The load has obviously a direct connexion with the speed at which work is done, but it has also a relation to efficiency. Benedict and I found, for instance, that both the gross and net efficiencies within the limits of our experiments increased with the load. The probable explanation of this result is that when light work is carried out maintenance or physiological requirements which have to be covered form a large proportion of the total energy output, a balance which is steadily altered as the amount of external effective work done increases. Incidentally, Hill drew attention to a most important factor in the consideration of the efficiency of muscle—viz., the relation between the maximal and the submaximal effort. Hill suggested that the less powerful effort was the result of the maximal contraction of only a portion of the muscle fibres, and that the fibres not directly involved in the contraction changed passively—i.e., they were made to conform to the shape of their active neighbours. This, of course, will automatically lead to a considerable waste of energy in changing the form of the muscle as a whole, therefore the submaximal effort will be less efficient than a maximal effort of the same duration in time, and further "the highest efficiency of a submaximal effort is obtained in a slower contraction than that of a maximal effort."

On the other hand, when the loads become excessive there is a definite falling off, both in gross and net efficiencies. Laulanié found that at voluntarily selected speeds, with steadily increasing load, the external work done rose with decreasing speed until the load became excessive. He maintained that there were two optima: (*a*) An economic optimum at 4 kilo. load with high efficiency and a low oxygen consumption per kilogrammetre; and (*b*) a mechanical optimum between 8 and 12 kilo. load when the output in unit time was highest. Table IV. from Laulanié makes his point clear:—

TABLE IV.

Resistance in kilos.

	1	2	3	4	5	6	8	10	12	15
(A) ..	1·49	1·07	0·80	0·61	0·54	0·44	0·37	0·29	0·24	0·13
(B) ..	448	642	726	778	812	853	*896*	*905*	*906*	570
(C) ..	3·5	2·44	2·17	2·14	2·23	2·25	2·43	2·53	3·12	5·31
(D) ..	14·1	20·4	22·9	*23·3*	22·3	22·1	20·4	19·7	17·0	9·4

(A) = Speed adopted, metres per sec. (B) = Work done, kilogrammetres per 5 min. (C) = Oxygen intake in c.cm. per kgm. (D) = Efficiency per cent.

It will be noted that when the load becomes excessive the efficiency rapidly falls away. This means that, although the effort may be continued as strenuously as before, and although the physiological cost of the effort remains at a very high level, the amount of external work done is reduced to a very low figure. The static element in the muscular effort has become dominant, and static expenditure is parasitic on dynamic work. The more static the work becomes the greater is the fall in the efficiency. Personally I am of the opinion that the severity or hardness of muscular work, qua the organism as a whole, is a function of the static component of the effort made. Fatigue—i.e., inability to carry on—is more readily induced by static work than by either positive or negative work. Experiments which I carried out with Miss Bedale and G. McCallum showed clearly this diminution in efficiency as the static element in the work is increased; another series of experiments carried out with Burnett led to the same conclusion.

Rhythm.

Very closely allied with the rate of working is the rhythm with which the work is performed. Although they are not identical phenomena, they are so closely related that the habit of work may be considered along with rhythm. Sir Charles Sherrington and Graham Brown have both shown very definitely, in connexion with their work on reciprocal innervation, that a rhythmic phenomenon may be evoked in muscle by the appropriate balance of antagonistic stimuli. Graham Brown holds that this rhythmic action is one of the most fundamental properties of the nervous system. Everyone is well aware that once a rhythm, or the proper coördination in the play of a set of muscles in the performance of some definite act, is mastered, not only is the energy expenditure reduced by the exclusion of numerous extraneous muscular activities, but there is an actual enhancement of the ease with which we perform the specified act. Those who do much repetitive work, be it playing golf, or a musical instrument, or working a machine, soon appreciate the fact, when they think about it at all, that their best and easiest results are obtained under certain very definite conditions. This rhythm of work is simply a general example of the formation of a conditioned reflex. The rhythm adopted, although it may suit the worker, is not of necessity the series of muscle movements which lead to the least expenditure of energy. Most probably the rhythm selected is only in small part due to the worker's physical configuration; in greater part it is evolved in imitation of some more experienced or older worker. The average workman is not so much concerned with the diminution of the physiological cost in the performance of a given act as in the reduction of conscious effort. As Vernon states: "Experienced industrial workers unconsciously adopt habits of work which tend to the production of a maximum output with the minimum of effort." This capacity of the organism to build up a series of conditioned reflexes is one of the potent factors in the prevention of fatigue. It is not, of course, suggested that the methods adopted by workers independently are perfect, and that proper investigation will not discover better and easier methods of performing certain given operations. If newer and more economical methods are to be brought into operation, the only real chance will be to segregate the newer young workers. Vernon gives an excellent example of the necessity of doing so. The output of a certain necessary stock article had to be increased. A factory concerned in the production turned out 5000 per week, and this could not be increased—the regular workmen had a certain rate and habit of work. A new factory was started, staffed with hands new to the work, and after six months' practice they produced 13,000 articles per week.

There is good evidence, that of Muscio for example, that both resting and working, in addition to the individual muscle rhythm, there is a definite variation in the course of the day in the capacity to carry out work; that, in other words, a diurnal rhythm exists. There is a certain amount of evidence also in favour of the view that a seasonal rhythm exists.

Further, when efficiency is measured in terms of output it is found that there is a definite rhythm in output during the course of the working day and of the working week. It is well known that it takes an appreciable time each day to work up to full power, and this is shown distinctly in the daily output curve, which rises and then drops sharply at the end of the work period. This type of curve is not peculiar to any one industry.

Rest.

The third of the potent factors in the control of fatigue is rest. If work is done rest is ultimately imperative. Rest not merely relaxes the muscle, allowing a more thorough and complete removal of the waste products and a more abundant supply of oxygen; it also removes the strain of attention. Rest is best obtained not by simple quiescence but by

change of posture; slow movement of another type to that which produced the fatigue will, unless the organism is tired practically to complete exhaustion, give the most beneficial results. Forced work—i.e., work carried out at a pace other than that of the performer's own selection, is much more exhausting and destructive than where the subject is permitted to work at a rate of his own selection. Laulanié, assuming that fatigue had a purely physical origin, went the length of maintaining that muscles spontaneously find the optimum rate of work where the intervals of repose exactly suffice for sufficient recuperation, so that long spells of work may be done. Such a conclusion does gain a certain amount of support from the consideration, for example, of the cardiac cycle.

So far, little attention has been paid to the duration of the rest period in relation to the work done. As a general rule, it may be said that, in the majority of occupations, although the hours of labour are continuous, the actual spells of hard manual work are discontinuous, either due to the fact that certain operations are intermittent in their severity, that supplies of material are not constant, or that, if these more or less natural conditions do not operate, rests at irregular intervals are deliberately taken by the operative.

So far as I am aware there is only one type of hard work where a definite rest period is laid down as part of the exercise—namely, in army route marching. Marching as a costly form of energy expenditure is unique in that it is a continuous repetitive act carried on frequently for hours on end. The regulations lay down that a definite rest period shall be taken every hour. Marching, too, is peculiar in another way—namely, that the rate of marching is fixed—i.e., a certain definite rate has to be constantly maintained throughout the marching period. It can be shown that if a certain distance has to be covered in a definite time there is an optimum rate of forward progression. Cathcart, Lothian, and Greenwood found, for example, that when the cost per mile alone was considered, the minimum value was reached at a rate of about three miles per hour, but when the question of time as well as distance arose—i.e., if a distance of one mile was to be covered and 60 minutes were available to do it in, the lowest hourly value was obtained at a rate of a mile in about 23 minutes—i.e., marching for 23 minutes in the hour and resting for 37 minutes.

So much, then, for the ordinary effector factors. There are many other factors directly concerned with the efficient action of the organism, some directly influencing the internal economy of the body, others acting more indirectly on the organism from the environment.

NUTRITION.

One of these factors is the state of the nutrition. It may be definitely stated that an insufficient intake of food or the consumption of poor or inadequate food is one of the chief sources of general inefficiency. The capacity of the body to store reserve food material which will meet the daily demands for energy and leave a surplus is another of the vital factors of safety. The body is undoubtedly capable of withstanding complete deprivation of food for comparatively long periods, but with a corresponding depression in its capacity to perform external work. Complete starvation is rare, and does not affect the question at issue. The much more important problem, chronic undernutrition, is unfortunately only too common; this condition lowers efficiency, not merely in the actual performance of muscular work, but by inducing an increased susceptibility to disease. This question has never received the attention which its importance demands, largely on account of the difficulties of carrying out a practical investigation. As the direct result of the war we have the records of at least two sets of observers. Benedict and his co-workers investigated the problem, using a group of 12 men, comparing them with a similar group drawn from the same class. In the experimental group the food intake was reduced, so that there was a loss of 12 per cent. of the body-weight. Although the experiment was carried on for over four months, and the basal metabolism reduced by 18 per cent., the diminution in muscle power, so far as laboratory tests were concerned, was not great. The subjective impression, however, of the subjects was that they felt weaker and less capable.

The other recorded experiment is that of the condition in Germany during the war years. A general statement of the effects of the blockade is contained in a long document prepared by the German Government (dated December, 1918). Admittedly the document was prepared for a specific purpose; but, after making all allowances, the record of the far-reaching effects of chronic underfeeding is valuable. Many of the statements receive corroboration in Prof. E. H. Starling's report on the food conditions in Germany. Apart from the increased death-rate, the increased liability to disease, and the slow recovery from the attacks of disease, the document definitely states that the working capacity of the people was reduced by at least one-third. The following sentence gives probably an accurate picture of acute undernutrition, associated, it is true, with much emotional strain:—

> "Everywhere in Germany it may now be observed how, in the four years' struggle for daily bread, the people have lost all their vigour and capacity for work; how all spirit of enterprise is gone."

Here, then, we have the actual record of an experiment on a gigantic scale. Personally, I believe that these results are much more likely to be the ordinary sequence of underfeeding than are the laboratory results of Benedict. His records are beyond reproach; but I feel that many of the excellent results which were obtained when the test subjects competed with subjects on ordinary food were in part due to the quite natural desire of the men to demonstrate to their friends and the onlookers that they were fit. In other words, there was a strong psychic element which vitiated the test.

Evidence, much debated it is true, would indicate that it is not only the quantity but the quality of the food consumed which plays a part in the fitness of the individual to perform hard muscular work. All modern work would seem to point to the conclusion that if the caloric value of the food supplied is adequate the actual demand for protein is very small. It is very difficult, however, to believe that the far-reaching common belief in the efficacy of a high meat intake, despite scientific evidence to the contrary, is without some foundation. It is possible that the value of meat (flesh) depends not merely on the high biological value of its protein, but also on its stimulation of cellular activity. Another important factor in general efficiency is the response of the organism to the multiple psychic imponderabilia which compose such a large part of the average environment. In human organisms, male and female, we are dealing with individuals whose performance is uniform neither throughout the year nor from week to week, nor even from hour to hour.

MONOTONY AND OTHER FACTORS.

In this connexion monotony of work must be considered. The Health of Munition Workers Committee stated that monotony is "analogous to, if it does not represent, a fatigue process in unrecognised nerve centres." It is true that montonous work, be it light or heavy, may be, as Goldmark maintains, "more damaging to the organism than heavier work which gives some chance of variety, some outlet for our innate revolt against unrelieved repetitions." Still, although there may be a close relationship between monotony and fatigue, as generally recognised, they are not identical. The temperament of the operative plays an enormous part in the determining whether or no any particular operation is a monotonous one.

Many other factors play a definite and important rôle in the maintenance of efficiency, such as lighting, heating, ventilation, the mode of life led by the

worker outside his definite hours of labour, his housing, &c. Many of these factors have been partially examined. Thus Leonard Hill has carried out a great deal of valuable work on the influence of the cooling power of the air. Vernon has collected much interesting evidence which shows that there is a very definite relation between the efficiency, as measured by output, and the temperature of the working place. The output in the hottest weather was about 30 per cent. below that when the weather was coldest. He also observed an apparent connexion between the relative humidity of the air and the efficiency of the worker. The efficiency, as might have been expected, was apparently greatest when the relative humidity was low. Elton has reported on the influence of lighting in silk weaving. He found that the output was lowest when artificial light was used. The actual equipment of the factories, the provision of seats of suitable size, height, &c., the design of the machines, and so on, all play their part, as is shown by the many records, particularly from the United States.

In other words, the real industrial efficiency of the worker cannot be causally related to any single factor. It is not the mere capacity of the individual to perform so many kilogrammètres of work in a given time with the smallest expenditure of energy. The quest of efficiency involves the whole welfare of our race and nation, and calls for the closest and most intimate coöperation between the scientific investigator, the employer, and the employee. It is no more capable of being settled on a communistic than on a capitalistic basis; it can only be satisfactorily attacked when mutual distrust of motives, capacities, and methods is stilled.

A Lecture
ON
RICKETS, MARASMUS, AND SCURVY.

Delivered at the Hospital for Sick Children, Great Ormond-street, London,

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IN the last few years a great deal of experimental work has been done upon the relationship of the accessory food factors to disease, and it seems to me to be worth while to devote a short time to the consideration of some of this work from the purely clinical point of view. I have given as the title of this lecture the names of three conditions common in infant life, and although I shall spend the greater part of the time allotted upon the first named of these conditions, it will be more convenient in the arrangement of the subject if I begin with the consideration of some points in connexion with scurvy.

SCURVY.

I do not propose to spend time in recounting the well-known signs and symptoms of the disease; I want to consider how far the experimental work on the accessory food factors has simplified the practical clinical problems. Before the introduction of the accessory food factors into the field of knowledge the clinician had learnt a good deal of practical value with regard to the causes and the cure of infantile scurvy. It was common knowledge that the main cause of the disease was the absence from the food of some factor contained in fresh unheated milk and in fresh juices of fruit and vegetables, and that the disease appeared chiefly in those infants who were artificially fed on infant foods of the proprietary brands or on boiled milk. It was common knowledge that if the disease was recognised by its early signs the administration of fresh juices of fruit and fresh unboiled milk soon caused an improvement in the condition with a disappearance of the symptoms. We knew, that is, that scurvy was, in the phraseology of the present day, a "deficiency" disease. But we knew very little of the distribution of the anti-scorbutic factor in the common foodstuffs, and very little of the quantitative value of those substances which certainly contained it. Of its chemical constitution we knew nothing. The experimental work of the last few years has put our knowledge on a sounder basis. We are now in a position to state for all the more common foodstuffs whether they are containers or not of the anti-scorbutic factor, and more in what degree of quantity each may be valued. Further, there has been some light shed on the chemical nature and the sources of the factor, though on this point our knowledge is rather of the hypothetical than of the proved order. We have learnt, further, in general principle what are the processes in the preparation and the preservation of foods which may be expected to have a destructive or partially destructive influence on the factor. Of course, there are still many debatable points in these questions. For example, it is still disputed by some authorities whether the preparation of the various forms of dried milk leads to the destruction of the vitamins, though to us clinicians the practical proof of their destruction is frequently obvious. In all but one of the cases of infantile scurvy which I have seen since the end of the war the diet on which the victims had been nourished was a well-known and extensively advertised form of dried milk.

Our knowledge, then, is more precise, and our prophylaxis should be more secure, owing to the work of the experimentalists. As regards the practical recognition and treatment of the disorder, can we record an advance? I think so. We are more alive to the milder symptoms of the disorder, readier to recognise it in its earlier stages, before the classical signs have developed. The occurrence of peevishness with a tendency to bruising is sufficient to set the clinician upon an inquiry into the details of feeding; and we are quicker than in the past to apply the knowledge we possess—that is, we owe to experimental work a more lively apprehension of the possibilities of "deficiency."

MARASMUS.

There is a type of wasting disease in infants for which from want of knowledge of its nature we have perforce adopted a name which is merely descriptive. Marasmus is one of those convenient names employed by everyone without any strict limitation of their meaning. To define it accurately one is driven to a series of negatives, but I believe that most physicians by their use of the term mean a condition in which the infant is taking a sufficient amount of food of an adequate quality for growth and development, yet without obvious cause remains stationary, or even loses in weight. If we can assign an effective cause for this state of affairs, if we can demonstrate an infection, or detect an inability to deal with some special constituent of the diet, the disorder ceases to be classifiable as marasmus. Now, for many years this disorder has seemed to me to be an example of what we now call "deficiency" diseases, and I have hoped that the progress of the experimental work on "deficiency" diseases would throw some light on the causes and possibly on the measures which might relieve the condition. Some of the work relating to the water-soluble vitamin B appeared to me to have a possible bearing on marasmus. The infant whose feeding is in every way, so far as one's knowledge goes, perfectly correct—whose motions are normal, who is not vomiting, and in whom there is no sign of gross disease—who yet wastes, bears at any rate a superficial resemblance to experimental animals fed on a diet sufficient in all respects save in the absence of vitamin B. Yet all our attempts to alleviate the condition in the infant by the administration of substances known to contain the vitamin in abundance have failed to produce any appreciable effect. It is, of

course, possible that we are not yet at the end of our discoveries with regard to the "deficiency" factors, and that this marasmic state may be due to the absence from the food of some factor not yet recognised. Meanwhile clinicians have been turning their thoughts in another direction, and the administration of small doses of thyroid substance has been, it is stated, of considerable service in such cases. My own experience in this direction is small, but so far I have been disappointed. Marasmus, in the sense in which I have attempted to define it, remains a mystery.

RICKETS.

When the importance of the vitamin factors in food began to be fully appreciated it was hoped that rickets would prove to be another example of a "deficiency" disease; numerous workers in this country, in the United States, and elsewhere began researches directed to the proof of the hypothesis. I do not wish to suggest that this experimental work was the first attempt to solve the mystery of the causation of rickets; there have been many previous experiments, but the appreciation of the importance of vitamins certainly stimulated research. The experimental work in this direction is by no means completed, but sufficient has been done to make it useful to review the results in the light of clinical experience.

For the last 30 or 40 years it has been recognised by the majority of clinicians that the most probable factor in the causation of rickets is an error in the diet, accompanied by other factors most likely to prevail in overcrowded and insanitary communities. About 25 years ago Cheadle, from his clinical studies in the disease, gave it as his opinion that it was chiefly due to the deficiency of fats in the diet, and to a less extent to a deficiency of proteins. "The chief and constant defect appears to be an insufficient supply of animal fat and therewith also in certain cases a deficiency of earthy salts in the form of phosphates; at the same time, if animal protein be deficient the disease is intensified. The development of the disease is also favoured, and it is aggravated in degree by evil external hygienic conditions such as want of light, warmth, and pure air." Since this time it has been recognised that a mere defect in the supply of fats was not enough to account for the origin of the disorder, since rickets occurs in many instances where there has certainly been no deficiency of fats in the food; further, it has been recognised that some of the worst rickets occurs in children who have had an excess of starch or other carbohydrate. For many years now it has been taught at this hospital that the chief dietetic factor is connected with the deficient supply or the defective absorption of fats together with an excessive supply of carbohydrates; and that unhygienic surroundings increased the intensity of the disorder.

Experimental work on the accessory food factors aimed at showing that by excluding from the food of the experimental animal some one of the accessory food factors rickets could be produced, and that as a corollary, just as in the case of scurvy, the addition of the essential vitamin would effect a cure of the disorder. In 1919 Mellanby, as a result of his work on puppies, had reached the conclusion that "there is good evidence that rickets is a deficiency disease due to diets which are unbalanced in that they contain too little of those substances rich in anti-rachitic factor and too much of those substances deficient in this respect. The anti-rachitic has, in many respects, a similar distribution to the fat-soluble A factor, and is possibly identical with it." Since this opinion was published, further experiments by Mellanby himself and by workers in America have modified the conclusion, and at present there is an increasing body of opinion which does not accept the hypothesis that rickets is a "deficiency" disease. There is a school of observers—represented in this country by Noël Paton, Leonard Findlay, and others—which is inclined to deny that rickets is a disease of nutrition at all, and contends that "by improving housing conditions the disappearance of the disease could be brought about." Criticism of the original doctrine and further experiments have brought a certain modification into Mellanby's views, so that he no longer states that rickets is a deficiency disease in the strict sense, and now, in 1921, sums up his results in the following fashion [1]:—

> "The conditions which tend to prevent rickets in puppies are (1) plenty of calcium and phosphorus in the diet; (2) something associated with certain fats probably identical with fat-soluble A; (3) meat; (4) the possibility of exercise."

On the other hand:—

> "The conditions which inhibit calcification or increase growth relatively to calcification so that defectively calcified bone results, are (1) deficiency of calcium and phosphorus; (2) deficiency of fat containing the anti-rachitic vitamin; (3) excess of bread, other cereals, and carbohydrates; (4) absence of meat; (5) excess of the protein moiety of caseinogen free from calcium; (6) confinement.

Thus Mellanby has so far departed from the original hypothesis that he regards the causation as due to a complicated series of interdependent factors; but still is able to say that "probably the most common cause of rickets in children is a combination of relatively deficient anti-rachitic vitamin, and excessive bread." He has further admitted the importance of the factor of confinement on which Paton and Findlay have always laid so much stress. Meanwhile the American workers have shown that there are still other factors concerned in the production of the bone changes of rickets. They have adduced evidence to show that sunlight has the power to inhibit the bony changes which are produced by a diet which in the absence of sunlight inevitably causes bony changes; and they have shown that starvation is able to check and even to abolish the rickety changes which have been produced in the experimental animal.

Now with a knowledge of these facts before our minds let us from the purely clinical standpoint endeavour to estimate (1) what clear additions to our knowledge we have gained by the results of the experimental work, and (2) how far the problem of causation has been solved.

Present Knowledge of Rickets.

The great advantage of experimental work is that, so far as it is accurate and adjusted to the end in view, it makes the knowledge so gained precise. We know at present with a precision not previously attained what are the conditions in which rickets can be produced in animals, and we are in a position to vary the conditions of the experiment at will. We know that rickets is not a simple "deficiency" disease in the sense in which scurvy is; we know further that, though it may be possible, as Paton and Findlay contend, to produce rickets in the bones of puppies who are on a diet which contains ample fat, it is a much easier and more certain method to exclude the animal fats from the diet; and we have experimental proof of the therapeutic value of cod-liver oil. Most of this knowledge, it may be said, was common to the clinician before the more recent experimental work. That is true, but a great deal of it was hotly disputed; indeed, on the continent there was an influential school which held that rickets was a congenital disease. Now we can at least be certain that it is a disease which can be produced by appropriate conditions in animals which at birth are perfectly healthy. Experiment has increased the precision of our knowledge. At present I think it has not increased our powers of dealing with the disease. All the precautions to avoid the onset of rickets, whether prescribed by the "vitamin" school or by the "social conditions" school of experimentalists, have been steadily recommended by children's physicians for the last quarter of a century. The treatment may be briefly summarised as correction of the diet, open air, sunlight, cleanliness, and exercise, or in children too young to walk, rubbing and massage of the muscles; and to these measures cod-liver oil was always added. This treatment has proved efficient and so far the experimental work has not increased our efficiency. Nor has it increased our

[1] Experimental Rickets, Med. Res. Coun.

power of diagnosis. And this leads me to some observations which, I think, are most important from the clinical standpoint.

Early Signs Should be Recognised.

In order to obtain a criterion by which they could determine success or otherwise in producing rickets the workers in the experiments have been obliged to look to the changes in the bones, especially in the long bones of the limbs and in the costo-chondral junctions. It is unfortunate that no earlier acceptable criterion of the existence of the disease was available, for all clinicians will agree that the changes in the long bones and ribs are by no means early changes in rickets. When they occur they imply a period of action of the underlying cause of the disease of some considerable duration; the greater our success in recognising the disease before the period of the development of these bony changes, the more amenable to treatment is the disease. It is true that the onset of the disorder is often so insidious that frequently children are not brought to the notice of the doctor till these bony changes are well advanced, but it is also true that the doctor should not only himself be able to recognise the disease at an earlier stage, but should actively teach that the bone changes can be prevented by attention to signs and symptoms fairly easy to determine. The prevalence of the bony deformities of rickets ought to be regarded as evidence that the doctor has hitherto failed in his duty to the community. So much attention has been in the past paid to the surgical correction of bone deformities that as a profession we have failed to enforce the doctrine that such changes ought never to be allowed to occur; no child should reach the stage where bony deformities require direct interference.

The early signs on which I should lay stress are five in number: (1) Head-sweating and restless sleep; (2) loss of muscle-tone; (3) polyuria; (4) pallor; (5) alteration in the bones of the skull.

The normal infant of six months or less sleeps without more than a moisture of the skin, wakes for its food, and then sleeps peaceably again. If in sleep beads of perspiration appear about the face and neck, unless there is some obvious illness the baby has rickets.

Even moderate sweating accompanied by undue restlessness and wakefulness has rickets for its explanation; but sometimes the sweating is replaced by loss of fluid from the urinary tract. The mother will tell you that it is quite impossible to keep the baby dry. Such polyuria is a frequent sign of rickets, and even were it unaccompanied by any other sign would arouse suspicion. But there is another sign almost invariably present. The normal baby has firm muscles; when awake he is in constant movement; and the least touch convinces the observer that the tone of the muscles is excellent. The rickety child, on the contrary, is slow to move, takes no delight in exercising his muscles, and these are found slack, soft, and slow to respond by contracting. This loss of muscle-tone is an early and characteristic sign of rickets. Pallor is not invariable, but is a common accompaniment of rickets. Yet some rickety children retain a good colour and any serious degree of anæmia is not a sign of rickets alone. It may be an indication of a slight degree of scurvy. The earliest changes in the bones are found in the bones of the skull. Often before there is any perceptible change in the long bones there is a softening in the lines of the sutures of the skull and the anterior fontanelle remains unduly wide. With this there is a delay in the eruption of the teeth and often a malformation of these when they do appear.

When any of these five symptoms are present there should be a suspicion of rickets and the diet and hygiene of the infant should be investigated and the known factors of rickets eliminated. If this is consistently done the fear of bony deformities is dissipated, for there is no disorder which yields so promptly to the appropriate treatment as early rickets.

When we attempt to answer the question whether the cause of rickets is known we must answer that the experimental work has up till now failed to provide a satisfactory theory. The "vitamin" hypothesis is so far not proved, and there are, as I have attempted to show, some cogent reasons for believing that rickets is not essentially a "deficiency" disease. Yet all clinical experience tends to support the idea that the diet has a large share in its production, and that the absence or deficiency of animal fats is an important factor. So far clinical experience coincides with the experimental work of Mellanby and others, but clinical experience also has long recognised that the factors on which the opposing school lays stress, the general unhygienic conditions associated with insanitary, ill-ventilated, and ill-lighted houses, are almost equally important. As clinicians we cannot give our undivided support to either hypothesis, and must recognise that the work of both schools has tended to confirm and establish the traditional views which were so clearly set forth by Cheadle at this hospital a quarter of a century ago.

THE PELVIC APPENDIX.

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So much has been written and said and done about appendicitis during the last 20 years that there may well seem nothing left to be told, but so long as the pelvic appendix still frequently betrays experienced and skilful surgeons, it is an obvious duty to contribute towards the lessening of the difficulties connected with it. In a paper published in the *Edinburgh Medical Journal* 28 years ago[1] I made this statement: "It is probably correct to say that sudden severe abdominal pain attended by a rise in temperature means mischief in the appendix." The aphorism, based upon recognition of the importance of general surgical principles, has stood me in such good stead that I should like to emphasise it. The general signs of inflammation are comprised in the term "fever"; of the local signs, the redness, the swelling, and the heat are invisible and inappreciable before the appendix is exposed, but in the ordinary case the right iliac protective muscular rigidity and local tenderness are additional invaluable aids to diagnosis. Remembrance of the aphorism has been most useful to me in pelvic cases, for without this a diagnosis of appendicitis would never have suggested itself in many of them. Even moderate requirements like this may not be satisfied, and an early diagnosis, which is so important in these cases, may be missed if too much reliance be placed upon such hints or ordinary signs. Much of the material I am using to illustrate points raised is taken from my old case notes, republished from papers in many different medical journals in "Surgical Contributions," Vol. II., and the references to pages throughout this paper apply to this book of mine.

Diagnosis.

Why is the diagnosis in pelvic appendix cases difficult? Over and over again it has been explained to me on seeing such cases that the patient had so little pain and seemed to be so well that no dangerous development was thought of. The absence of serious pain or discomfort was always emphasised, because this has been one of the chief diagnostic symptoms to be relied upon in ordinary cases. Like cancer, appendicitis has popularly come to be associated with severe pain, and in both serious delay may occur as a consequence of its absence. The pain of appendicitis before rupture or gangrene of the appendix has occurred is, like nearly all surgical pain, due to tension; if there is drainage from the cavity of the inflamed appendix, pain is never severe; if, on the

[1] Contributions to Surgery, vol. ii., p. 108.

other hand, the appendix cannot empty itself, pain, for the first few hours of a serious colicky character, later becoming continuous, is an urgent symptom. A stercorolith or an old stricture may be the cause of the block, but more commonly neither of these is found. In 1900 (p. 347) I offered an explanation of total gangrene of the appendix after careful examination of many specimens of normal intestines, and it was:—

"The appearance of the appendix in these severe types is very characteristic; it looks like a large tense yellow sausage. On section it is found to contain a few drops to as many drachms of stinking fluid and the walls are completely necrotic. . . . Just at the cæcal attachment of the appendix there is often a thickened band or collar of peritoneum. When the mucous membrane about this point becomes inflamed the walls very soon become apposed and the cavity of the appendix is converted into a closed sac. The exudation from the mucous membrane continues, the organ becomes more and more distended, and the increasing pressure of the contents, unless relieved by discharge into the cæcum or by perforation, produces total gangrene."

In describing the symptoms produced by this type of appendicitis, I say (p. 813):—

"The symptoms produced are similar to those of a strangulated hernia, because they depend upon the same causes, viz., acute distension and vascular disturbance in a piece of bowel. There are acute pain, urgent vomiting, and inability to pass flatus. But there is *no* hernia, and there *is* a rise in temperature and marked tenderness and rigidity in the right iliac fossa."

If this type of appendix hangs into the pelvis and becomes inflamed there should be no real difficulty in diagnosis in the early stages, because there are urgent symptoms before gangrene or perforation has occurred. The usual long pelvic appendix is not, I believe, of this type so often as the ordinarily placed organ is. It has retained some of its fœtal characteristics and has a wide funnel-shaped opening into the cæcum, which is difficult to block by inflammatory swelling. With this type of appendix urgent symptoms are not caused by inflammation, unless a stercorolith or an old stricture happen to be present. Drainage of the inflammatory exudates consequently occurs, and until the surrounding peritoneum is seriously infected the patient makes no extraordinary complaint. It is in this type of appendix that a "natural cure" so frequently follows inflammation (see for illustration Vol. I. "Surgical Contributions," p. 312).

Illustrative Cases.

Other points in diagnosis, prognosis, and treatment will be emphasised by the relation of cases.

CASE 1.—The child, aged 1 year and 11 months, of a capable and experienced medical man was first brought to a private hospital under my care on Jan. 27th, 1914, at 9.30 A.M. Her illness began on Jan. 23rd, when her nurse, thinking she had abdominal pain, asked her father to see her. He suspected appendicitis, and in the evening felt confident of this, as her temperature was 103·4° F., she had vomited twice, and was tender and rigid in the right iliac fossa. Next day two distinguished surgeons made a diagnosis of tuberculous cæcum, and two equally distinguished physicians thought the condition was appendicitis. When I saw her on the fourth day of her illness there was a large tender right iliac swelling, and a temperature of 105°. An hour after her admission I operated and a large quantity of pus under considerable pressure was discharged. Two drainage-tubes were introduced, one at each end of the wound, which was closed by sutures between them. Owing to the serious condition of the baby no search was made for the appendix. She was sent home entirely recovered in 12 days. From that time until September, 1921, she was well, then she became pale and anæmic, lost her appetite, and was occasionally sick. A physician who was consulted thought she might be developing chorea, but after three or four weeks' treatment she much improved.

On Oct. 31st, 1921, she had some pain in the abdomen. Her father found some tenderness and a little rigidity in the muscles overlying the right iliac fossa. I saw her with him the same afternoon—nearly seven years after her operation. She was a very sensitive and nervous, but healthy-looking, quite cheerful little girl, who moved about briskly and freely, had normal pulse and temperature, ate a large raw apple with evident satisfaction, and walked to the private hospital—about a quarter of a mile—without help. She was taken in for observation, and examination of her blood showed a leucocytosis of 30,000. The same evening her temperature was normal, but she slept fitfully all night and had occasional pain, and in the morning her temperature was 101°. Operation was performed at mid-day of Nov. 1st, 1921. The old scar was excised and the abdomen opened by an oblique incision in the right iliac fossa. The small intestine exposed was reddened, and some purulent fluid escaped. The appendix was found dipping over the pelvic brim, hanging into the pelvis and firmly adherent to the bottom of the pouch of Douglas. Fully ½ oz. of pus escaped from the pelvis. The excised appendix was acutely inflamed throughout and perforated at its tip. A single drainage-tube was used, and the patient went home healed and well on the 26th, 25 days after the operation.

CASE 2 (p. 200).—"A very big, stout man, aged 42. He had never been ill before, but two days previous to the sudden and severe commencement of his present illness, he had felt some uneasiness in his bowels. *There was no bad pain, and he went about his duties* and was able to sleep. Early on the morning of the third day he was awakened by an agonising pain all over the bowels, which made him feel sick and faint and cold and sweating. On July 23rd, 1895, eight days after the illness commenced, an oblique incision was made over the cæcum which was exposed. I could feel the firm, enlarged appendix dipping over the pelvic brim and some fœtid pus escaped. A drainage-tube was left in the pelvis. Post-mortem showed a gangrenous perforation of the end of the appendix and a fæcal concretion close to it."

CASE 3 (p. 383).—"A man, aged 41, was admitted to a private hospital on June 20th, 1900, after an indefinite abdominal illness of one week's duration. In the right iliac region there was a distinctly tender point, but no rigidity or swelling could be felt. Bimanually (a finger of the right hand in the rectum and the left hand on the front of the abdomen), a definite tender tumour of the size of a large orange could be felt hanging into the pelvis and fixed to the pelvic brim." He recovered after removal of the appendix and drainage of the abscess.

Remarks.

Ordinary rules for the diagnosis of appendicitis are inapplicable to cases of this type. Abdominal uneasiness rather than pain, an absence of right iliac rigidity or tenderness, no vomiting, no threatening symptoms, make it easy to come to the conclusion that there is nothing seriously wrong. All the same, these cases are as dangerous as any, and more so than most, unless an early operation for the removal of the organ is done. Occasionally, especially in boys, frequency of micturition occurs as an early symptom, and I have seen such cases lead skilful doctors astray, because, especially if *Bacillus coli* had been discovered in the urine, the attack was attributed to bladder inflammation. In rare cases I have known retention of urine the first warning of danger, but in these instances a pelvic abscess was always found on rectal examination.

Rectal Examination.

The perfunctory performance of rectal examination is of little value—it must be carefully carried out. In the earliest stages of the illness tenderness on the right side as compared with the left of the pelvis is suggestive. If the appendix can be felt, as it sometimes can, the diagnosis is nearly certain. It is not quite so, as other conditions—e.g., a stone in the lower part of the ureter—have misled me. Every tube in the body resents the intrusion of an unaccustomed stimulus on the first occasion, and the rectum is no exception. A first rectal examination produces disagreeable sensations, which in sensitive subjects may amount to pain, and except when only gross conditions are present it has to be made with skill and care to discover anything. This is the first point I want to make with regard to these difficult cases: *A careful rectal examination should be made on any patient with an acute abdominal illness attended by uneasiness or pain and in which a definite diagnosis cannot be reached.*

A second point is the importance of a blood count. It has surprised me to know how often this is still neglected even in hospital practice in this country. *A leucocytosis of anything over 10,000 chiefly polymorphs is definite evidence of an infection somewhere in the body.* In a large number of instances this has helped me as the deciding factor in favour of operation in pelvic and other dangerous but obscure cases of appendicitis. If a diagnosis has not been made till

perforation of the pelvic appendix has occurred, the rule then is that a sudden pain and general disturbance sufficiently alarming to stir up everyone concerned follows, and if the perforated appendix is not immediately removed a pelvic abscess more or less quickly develops.

Treatment.

So early as 1894 (p. 109) and again in 1896 (p. 222) I emphasised as strongly as possible my objections to the use of purgatives which then had strong advocacy and support.

"On the question as to whether purgatives or enemata should be administered in the early stages (of appendicitis), I hold strong views. That benefit may follow their use in certain cases I do not care to deny, but that a bad attack may be prevented or removed by a purgative or an enema my pathological information will not allow me to believe. The cases that get well after a purgative or an enema are those which would have got well, possibly more slowly, without either; whereas a purgative or an enema has so frequently been the precursor of urgent symptoms in cases I have seen that there is no doubt left in my mind that the aggravation of symptoms was the result of this form of treatment."

Since then surgeons have over and over again repeated this warning, but even now I seldom see a patient to whom castor oil has *not* been given. Twenty-eight years seems a long time to take to learn and digest a surgical lesson such as this, and it is now time that it was assimilated. Abdominal distress now demands thorough careful questioning, observation, and examination with the object of making a diagnosis as to the cause of the disturbance possible before doing anything else.

Pelvic Abscess.

A pelvic abscess, the result of appendicitis, though the usual consequence of a pelvic appendix, not infrequently follows a less direct infection. Indeed, extension from a right iliac appendix is the most common cause of pelvic abscess. This may remain a local condition or spread by continuity over the pelvic brim reaching the left iliac fossa; or it may be the result of an infection which has spread by contiguity from the appendix into the general peritoneal cavity causing at first diffuse infection, later becoming localised in the pelvis and perhaps elsewhere. The first type is so well known as to require no description here. The following case is a good example of the second type, which is fortunately a less common finding since early operation became the rule.

CASE 4 (p. 522).—"Male, aged 15, admitted to the infirmary on Sunday, August 3rd, 1902. On the previous day I had seen him and made a diagnosis of general peritonitis following appendicitis of six days' duration. Two days later (Monday) his general condition was good, there was a tumour in the hypogastrium like a distended bladder, per rectum there were signs of encapsulated fluid in the recto-vesical pouch which was bulging down the anterior rectal wall. The same day the abscess was opened per rectum. Four hours later the boy collapsed, vomited bloody fluid, and died late on night of operation. Necropsy: General septic peritonitis. Pus all over and in pockets among the coils of small intestine. The remains of a large abscess were found in the pelvis. There was a large collection of pus in the hepatic pouch and extending up over the liver. The appendix was long and hanging down into the pelvis, its end was gangrenous, and it contained an enterolith. Pus collections between intestinal coils were large and appeared to be residual. Note on Monday (day before death) the patient seemed so well that my previous diagnosis of general septic peritonitis was gravely doubted. On Tuesday (day of operation) the boy *appeared to be in excellent condition*, and at the operation it was remarked how safe and easy a proceeding the opening of a pelvic abscess per rectum was. His death was unexpected and the post-mortem revelation a surprise."

Rectal Tenesmus.

"Rectal tenesmus in any case should demand a rectal examination. In the ordinary pelvic abscess case it is likely to be an urgent and typical symptom. It is due to the abscess pressing upon the anterior wall of the rectum and causing œdema and bulging of the wall. Associated with it later is a spurious mucous diarrhœa and frequently sphincter paresis" (p. 512).

In women the diagnosis is more difficult than in men, and I have many notes of cases of pelvic peritonitis due to other acute conditions mistaken for appendicitis—such as ovarian cysts with twisted pedicles, leaking ectopic gestations, gonorrhœal salpingitis, pyelitis, and stones in the lower end of the ureter. All of these may require a careful history and skilled examination for their differential diagnosis. The following notes will serve as an example of these manifold difficulties:—

CASE 5 (p. 381).—Pelvic appendicitis in a female; pus draining through the Fallopian tube. A single woman, age 27 years, was admitted to the Royal Infirmary, Newcastle, on Sept. 26th, 1899. On the 21st, while in bed, she felt a sudden pain about the stomach, and vomited. On the 22nd she took some castor oil which was vomited. An enema administered later brought away some fæcal matter. On the 23rd the pain settled in the right iliac region, and she continued to vomit. On the 24th and 25th she had difficulty in passing urine, but her bowels were moved. The pain and vomiting continued. On admission to the infirmary at 9 A.M. she was flushed, had a coated tongue, and a temperature of 100·8° F., and a pulse of 120. The whole abdomen was slightly distended, tender, and rigid. The note over the lower abdomen was dull on light percussion. Per rectum nothing was found. The patient was menstruating and passed through a normal period. After her admission the pain abated, the vomiting ceased, and four days later her temperature became and remained normal. On Oct. 5th, ten days after her admission, as a pelvic swelling was still palpable from the abdomen, she was examined under an anæsthetic. An indefinite firm mass was felt in the left iliac region. Per vaginam the hymen was found to be intact and the vagina virginal. A soft, fluid, immovable swelling, apparently of the size of a fœtal head, bulged into and filled the anterior and lateral vaginal fornices. The bladder was emptied by a catheter and the swelling found to be entirely in front of the uterus. This was confirmed by the uterine probe. On withdrawing the uterine probe some fœtid pus escaped from the cervical canal. The diagnosis suggested was that of suppurating dermoid ovarian cyst ruptured into a Fallopian tube. Operation was performed on Oct. 10th. The abdomen was opened from the umbilicus to the pubes, when the pelvis was seen to be filled by a mass covered by adherent intestine. The abdominal cavity was packed with sterile gauze, and the patient was placed in the Trendelenberg posture. On separation of the intestinal coils a large quantity of very offensive pus escaped and was quickly mopped up. The pouch of Douglas was practically a large abscess cavity, and the abscess extended upwards into the left iliac fossa. A fæcal concretion was found lying at the bottom of the pelvis, and on drawing the adherent cæcum forward a sloughy opening of the size of a sixpenny piece was found in it at the position occupied by the insertion of the appendix. The whole appendix had sloughed off. The right side of the abscess had been drained by the right Fallopian tube, which was slightly thickened but pervious, and had stinking pus in its lumen. The opening in the cæcum was sutured, the right Fallopian tube excised, and a large drain opening made from the bottom of Douglas's pouch into the vagina; the abdominal wound was entirely closed except at the lower end, where a glass tube was left. Cultivations from the gauze drain removed on Oct. 14th, four days after the operation, showed the *Bacillus coli communis* only. On the 18th, eight days after the operation, there was a free discharge of fæcal matter and pus from the vagina, and the temperature rose to 102°. This discharge continued, and on the 24th she was very ill, with a profuse discharge of fæces and pus from the vagina and from the lower part of the abdominal wound, and a temperature of 103° in spite of frequent douching through a tube introduced into the vaginal opening. Constant irrigation was now adopted, and the cavity was flushed through from the vagina to the abdominal wound with sterile hot saline solution day and night. If the irrigator was stopped for a few hours her temperature rose and the irrigator had to be restarted. It was continued until Nov. 9th. She was discharged nearly healed on the 20th. In September, 1900, she returned to have a small ventral hernia, of the size of the drainage-tube, at the lower part of the ventral scar, operated upon. She was in good health, and bimanual examination could discover no sign of adhesions or any other abnormality in the pelvis.

Treatment.

The chief aim of this, in pelvic as in all cases of appendicitis, is to make a sufficiently early diagnosis to allow of removal of the appendix before it has ruptured, infected the peritoneum and caused an abscess. No one will now dispute this, though it is still too often a counsel of perfection, but considering the progress already made, is one capable of achievement if sufficient care and thought be brought to bear on each case. Within the first two days of the

illness I think all will agree that the appendix should be removed through an abdominal incision, and if the escaping pus is offensive or in large quantity, that the pelvis should be drained, preferably by a glass tube kept dry by frequent emptying with a syringe and long rubber tube attached (p. 884). If this be done I have drawn attention to the need of protecting (or if this is not possible of dividing and ligaturing) the deep epigastric artery to prevent secondary hæmorrhage from it (p. 822). When definite signs of a pelvic abscess are discovered after the fourth day, especially if the small intestines are distended, and the patient is still ill-looking, I believe that an immediate operation does not give the patient his best chance, and may be fatal. Experience has impressed upon me the importance of waiting, watching, and medical treatment (p. 536). Some pelvic collections find their way into the adjoining intestine, never so far as I know into the general peritoneal cavity, and recovery follows; more of them after a time increase in size and require operation, but this must be postponed till rectal tenesmus and bulging of the rectal wall make relief necessary.

I first advocated drainage through the rectum in 1896[1] and my faith in the operation has steadily increased, because it is one of the safest and most satisfactory in surgery if properly performed at a suitable time. In women the abscess may often be, perhaps more conveniently, opened into the posterior vaginal fornix. Very ill and suffering patients are restored almost at once, and in three or four days have quite recovered their appetite and their feeling of well-being. If premature attempts are made to open the abscess, it becomes difficult to keep it drained, and repeated and dangerous explorations may have to be done. If, on the other hand, courage and patience are exercised until the abscess is "ripe," a strip of iodoform gauze left in the opening and projecting from the anus suffices to keep the wound open long enough to complete the relief. Even this I seldom touch, but allow it to come away by itself with the first bowel movement. No further plugging or drainage are necessary or useful.

My belief, based upon considerable post-mortem and clinical experience, is that the boy (Case 4) would have recovered possibly without, but more probably with, surgical aid limited to drainage of abscesses if operation had been postponed. Any time after a fortnight of complete recovery the appendix should be excised.

Normal Resistance of the Peritoneum and Acquired Peritoneal Immunity.

Twenty-eight years ago (p. 72), in a paper contributed to the *Edinburgh Medical Journal* at a time when the advance of abdominal surgery was being hindered by the old dread of opening the peritoneum, I approached this question as follows:—

> "On several occasions I have observed in abdominal wounds dressed for the first time on the tenth day, that though the superficial parts were suppurating, the peritoneum was not involved—both, of course, having been exposed to the same deleterious influences. I have also noticed, not without surprise, that rougher surgery may be perpetrated with impunity inside of the peritoneum than would be tolerated by any portion of the organism outside of it. The unavoidable conclusion is that the peritoneum has a resisting power not belonging to other tissues."

It seems now, at a time when one of the main objects of operation is to prevent peritonitis, almost impossible to realise that any such dread existed about inflammation of the peritoneum. I have already conveyed a hint in connexion with immunity, that for tubular organs this is largely acquired, and I propose to suggest a principle bearing upon this, applicable to every part of the body. During the last week an intelligent patient came under my care with a synovitis following "locking" of his knee-joint. He had had two operations for the removal of a loose cartilage previously, both of which had failed to remove his disability. A large incision into the joint disclosed a rim of loose internal cartilage left attached round the inner side of his joint and a lipomatous mass. Both were excised. The first operation had been followed by much pain, the second by less, and the third caused scarcely any disturbance at all. This is not an exceptional experience, but is the rule in similar cases.

Acquired Peritoneal Immunity.

The older surgeons recognised that ovariotomy on a patient who had been tapped and had peritonitis, although perhaps requiring a much more difficult and tedious operation, was followed by less disturbance and smaller mortality than were simple cases without adhesions. They offered no explanation of this experience, but acknowledged it as a curious phenomenon which seemed to be inexplicable. It is not. Acquired immunity of the peritoneum is an asset of great value to the surgeon, and one that has not yet received due recognition. A first operation in the abdomen is followed by what I have called a Trinity of Terrors. The patient is less or more *sickly* for 24, *thirsty* for 48, and *griped* for 72 hours. After a second operation these symptoms, if they appear at all, are scarcely disturbing, and after recovery from an acute infection the peritoneal cavity has acquired such a degree of immunity that it is scarcely possible to infect it again. Every observant surgeon must have noted the safety of gastrectomy or colectomy done in two stages. It is unfortunate that a double-barrelled operation promotes the dissemination and recurrence of cancerous growths in the abdomen, or this would become the favoured method of dealing with these cases.

As illustrating the importance of acquired immunity the following record will suffice.

> CASE 6 (p. 607).—"The patient, a female, aged 35, was operated upon first on June 10th, 1902. She was then very ill, with an acute abdominal illness diagnosed as abscess in the pelvis and in connexion with the vermiform appendix. Her abdomen was opened over the right iliac fossa by an incision extending from the loin behind. Some clear fluid escaped on opening the peritoneum. The colon and the cæcum were adherent to the parietal peritoneum on the outer side, and on gently separating them fœtid pus escaped. The appendix was found lying on the outer side of the cæcum and colon, with its tip pointing upwards to the hepatic pouch, and was excised. The pelvic brim was filled with matted adherent intestine. The abdominal wound was covered up, and the patient was placed in the lithotomy posture, the pelvic abscess, from which a large amount—about one pint—of fœtid pus was evacuated, being opened and drained through an incision in the posterior vaginal fornix by drainage-tubes sewed in. The vermiform appendix contained a stercolith, and was perforated at its centre."

In a month the patient had recovered and had arranged to go home (July 14th, 1902), when she was suddenly seized with symptoms of acute intestinal obstruction and became very ill.

> "The second operation was performed a few hours later. The abdomen was opened in the middle line. The small intestines were congested and beginning to distend, a distended loop leading to the pelvis where the obstruction was located. It was due to adhesions, many of which were easily separated, but those in the depths of the pelvis became more dense. In separating a loop there a small abscess was opened and pus escaped. Traction on the inflamed and adherent loop resulted in tearing the intestine almost completely across. Six inches of torn and adherent intestine were excised, and an end-to-end anastomosis was made by catgut sutures. The pelvic abscess was thoroughly mopped, and the whole pelvis was washed out with saline solution. The abdomen was entirely closed and the patient recovered."

Intestinal Obstruction as a Result of Appendix Abscess.

In this case obstruction symptoms were delayed for one month; in the majority of cases they commence during the second or third week after drainage of the abscess. Since the use of gauze for drainage purposes was discontinued, obstruction has been a rare event in ordinary abscess cases, but it still follows pelvic abscess with disconcerting frequency. Fortunately, recovery has advanced so far that recognition of the complication is easy, and if an early diagnosis is promptly followed by operation recovery can be counted upon, in spite of the presence of an active infection. Recurrence of obstruction must be rare,

[1] Brit. Med. Jour., 1896, ii., 1005.

for I have never seen a case, but patients' friends should be warned of possibilities, as late obstruction can occur long after the attack has been recovered from; I have notes of cases as long as ten years afterwards. The following example will suffice to illustrate these points:—

CASE 7 (p. 621).—"Female, aged 40, admitted to Royal Victoria Infirmary, Newcastle, on Dec. 30th, 1902. She had been operated upon in March, 1900, for appendicitis with abscess. A pelvic abscess which developed during convalescence was opened from the vagina. Until two weeks ago she had been quite well. Two weeks ago she had a sudden attack of pain in the stomach. It was a continuous pain and made her vomit. Her bowels had not been moved since. On Dec. 31st, after a dose of castor oil (1 oz.) her bowels were thoroughly moved. The distension subsided, but she still complained of pain in the left hypochondrium. Jan. 1st, 1903, she was fairly well till the afternoon, when acute pain commenced and she began to vomit. At midnight there was moderate distension and visible peristalsis. The vomited matter was only food she had taken. After a simple enema her bowels were well moved.

Jan. 2nd, 1903, I found as follows: The patient looked ill and complained greatly of griping intermittent pains. Her hands and face were cold, pulse 128 and very soft, tongue dry in the centre. There was a median scar on the abdominal wall between the pubis and the umbilicus. The lower part of the abdomen was slightly distended. Intestinal movements were so vigorous as to be obvious. The right hepatic region was tender. No mass was felt. P.V., uterus pushed back and fixed.

Operation (Jan. 2nd).—Immediately after the conclusion of the examination ½ gr. of morphia was injected hypodermically. Local anæsthesia was then induced by infiltration with eucaine. A few drops (not more than 25 min.) of chloroform were administered by inhalation as a placebo. Enterostomy was done in the right flank by opening the first presenting and distended loop of small intestine. A Paul's tube was tied into the bowel. The operation took a quarter of an hour. The operation was well borne and there was very little pain. The tube discharged brown fæcal matter, but though there was relief of all urgent symptoms she never picked up, and died five days later.

Necropsy.—There was no gross evidence of general septic peritonitis, but the intestines were sticky and slightly adherent. The enterostomy opening was found to be at one-third of the distance from the duodenum to the ileo-cæcal valve. The small intestine, both above and below the enterostomy opening, as far indeed as the seat of obstruction, was distended with gas. The obstruction was in the pelvis. A loop, 6 inches long, of small intestine was strangulated under a band (the result of old peritonitis). The band passed from the cæcum to the mesentery of the loop of intestine which had slipped under it. The constriction was not very tight, and there was no gangrene either of the strangulated loop or of the part over which the band passed. The obstruction was at the commencement of the lower one-third of the small intestine; and below this the bowel was collapsed, and the coils adherent to one another, to the pelvic wall and to the pelvic viscera. There was no disease of any other organ. As evidence of an old general peritonitis, there were, in addition to the pelvic adhesions, adhesions between both lobes of the liver and the diaphragmatic peritoneum. No cause for this but the previous attack of appendicitis was found."

Another problem raised by Case 6 is the manner of dealing with the adherent intestine to avoid tearing of it in such difficult cases—and I think I can offer a solution based upon subsequent experiences. Instead of endeavouring to separate the coils by *traction* it is best to introduce a hand and find the line of cleavage between the bladder and clumped intestine in the male, and the uterus and the intestine in the female. With the back of the hand towards the bladder or uterus, and the palm facing the intestines and closely hugging the bladder or uterus, the fingers are insinuated between them to the pelvic floor, then keeping them curved, separation of adhesions below is continued in close contact with the recto-vesical pouch, when the wh le of the adherent intestine, often wallowing in pus, can be drawn forward and out of the abdomen, where separation and if necessary repair can be more easily accomplished. If this operation can be performed early the patients are immediately relieved and seldom fail to recover, as peritonitis has ceased to be a serious danger because of their acquired immunity.

In six very serious and difficult cases, four of my own, one of Mr. W. G. Richardson, and one of Prof. Brunton Angus, an operation suggested by me was carried out in each. All were women. In three of them a pelvic abscess due to appendicitis was the cause of the trouble, in three pelvic abscess from salpingitis. All had been operated upon, and after operation developed a fæcal fistula through the wound. They were all, with the exception of one case, very ill, with high temperature and free purulent and fæcal discharge. A variety of treatments had failed to help them and death seemed to be inevitable unless something more could be done. In all six vaginal hysterectomy was performed, the broad ligaments were secured in clamp forceps, and the pelvis between the forceps and surrounding them was packed with strands of iodoform gauze to allow of free pelvic drainage. All recovered from the operation, and the five acute cases made a complete recovery within three months after the operation. The less ill case (pyosalpinx) improved, but a year later was reported to me as still having a fæcal fistula. Such an operation can seldom be necessary, because fæcal fistulæ when buried (i.e., if the mucous membrane is not attached to the surface) seldom fail to close themselves. A record of this method may, however, be useful if an otherwise hopeless situation has to be faced, because the successes obtained now justify the proceeding.

Conclusions.

Inflammation of the pelvic appendix can still mislead diagnostic experts. The ordinary symptoms of appendicitis—abdominal pain and fever—may both be absent in pelvic appendix cases.

The severe pain often attending appendicitis in the early stages, wherever the organ is situated, is due to tension within the appendix resulting from retention of its contents. During this period the symptoms are similar to those of acute intestinal obstruction.

Prolonged tension results in gangrene, when acute pain disappears until perforation occurs and a second variety of pain due to peritoneal irritation suddenly develops. In many pelvic appendix cases there is no severe early pain. Not until the appendix has perforated, generally at its distal end, are urgent symptoms noted. Absence of pain is not special to the pelvic appendix, but is more common in this than any other variety. The explanation offered is that tension is not present, because this type of appendix can empty itself, and the first serious pain results from perforation.

Frequency of micturition, especially in boys, and in rare cases retention of urine, occurs as an early symptom.

Careful rectal examination may save the situation in a difficult case. So may a blood count.

Pelvic abscess may result from the localisation of a diffuse peritoneal infection, from leaking of an abscess connected with the appendix in the right iliac fossa, or from a leaking pelvic appendix.

Rectal tenesmus is the most suggestive symptom of a pelvic abscess.

The treatment of an inflamed pelvic appendix is to remove it as soon as a diagnosis has been made. After the second day from perforation it is seldom wise to operate from the abdomen, and this should never be done if the intestines are distended or the patient is acutely ill. Medical treatment is then the method of choice, until the abscess points in the rectum so prominently that it can be safely and easily opened there.

The normal peritoneum possesses an extraordinary natural immunity, but the importance of its acquired immunity is not yet appreciated fully.

Intestinal obstruction follows operations for pelvic appendicitis with disturbing frequency. When convalescence seems assured, during the second or third week, it develops suddenly. Early operation will save nearly every patient—delay is deadly. Following abdominal operation for pelvic abscess a complicated fæcal fistula may refuse to heal and threaten life. In women vaginal hysterectomy will save the majority of these dangerous cases.

SALIVARY GLANDS IN CARCINOMA:

A STUDY OF THE CONDITION OF THE SUBLINGUAL AND SUBMAXILLARY SALIVARY GLANDS IN CARCINOMA OF TONGUE AND FLOOR OF MOUTH; WITH A NOTE ON THE SUBMAXILLARY LYMPH NODES.

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No one conversant with the literature of malignant disease of the tongue and floor of the mouth can fail to have been impressed with the fact that although the spread of carcinoma to the lymph nodes is dealt with most exhaustively, yet writers on the subject of carcinomatous infection in this region omit all mention of the salivary glands with a unanimity which is as surprising as it is significant. Indeed, a fairly exhaustive search into the literature has resulted in only the following reference, which occurs in Butlin's classical work[1]:—"Malignant infiltration of the sublingual salivary gland is the result of direct infiltration. The submaxillary salivary gland may be infected in the same manner, but infection commonly spreads into it from lymphatic glands which lie within its capsule, before any direct extension to it has taken place." There is no indication here of the frequency of such invasion, and, moreover, no reference is made to any research into the microscopical appearances in such cases. Only in Volkmann's reclassification of malignant tumours of the submaxillary salivary gland is any reference made to the application of microscopy in these cases: here is a record of four cases of epithelial carcinoma (carcinoma epithelioides), a condition which must be, presumably, secondary to a primary focus in either the mouth or tongue.

In view of the above facts, associated as they are with the well-known clinical finding that in such cases the salivary glands are hard and frequently enlarged, being apparently the site of an extension of malignant disease, it was deemed of interest to inquire into the microscopical condition of the salivary glands in these cases of carcinoma of tongue and mouth. The results of this inquiry are appended.

Conditions of Inquiry.

For the purposes of this inquiry only those cases of carcinoma in which both the primary growth and salivary and lymphatic glands were examined microscopically have been included. The total number of cases dealt with is 78—roughly, *one-third of the cases* of carcinoma of tongue and mouth operated on in St. Thomas's Hospital during a period of eight years—i.e., 1910–14 and 1919–21. The war years, when owing to stress of circumstances routine examinations could not be systematically carried out, have been omitted with a view to elimination of any source of error.

Clinical Classification of Cases.

From a clinical standpoint the cases fall into three groups:—(*a*) Those early cases of carcinoma of tongue where the organ is still mobile and the infiltration slight; (*b*) those cases of carcinoma of floor of mouth, and late cases of carcinoma of tongue, where the tongue is fixed and the muscles extensively infiltrated; (*c*) cases of carcinoma of lip.

In all these cases the submaxillary salivary gland was either enlarged and hard, or hard, being in some cases of a stony consistency—that is, it was clinically extensively infiltrated with carcinoma. It was further observed that in many cases this condition was practically identical whether the case was early or late; though it was noted that in cases where sepsis was present in the buccal cavity, especially if severe or of long standing, and due either to septic teeth or infection of the malignant ulcer itself, the changes in the submaxillary and sublingual salivary glands were more marked.

Results.

The primary growth was found in all cases to be a squamous-celled carcinoma (epithelioma) on microscopical examination. The results of the investigation are appended in the following table, which

Table Showing Grouping of Cases and Nature of Clinical Findings.

Group.	Total.	Salivary glands.			Lymph nodes.		
		Carcinoma.	Inflammation or no change found.	Percentage *free* from carcinoma.	Carcinoma.	Inflammation or no change found.	Percentage *free* from carcinoma.
A	22	0	22	100	6	16	72·7
B	38	2	36	94·7	19	19	50
C	18	0	18	100	17	11	61·1
Total ..	78	2	76	97·5	42	46	58·9

gives (1) the actual number of cases in each of the clinical groups (*a*), (*b*), and (*c*) mentioned under the previous heading; (2) the number and percentage of cases in which the salivary glands were found to be the seat of carcinomatous changes, or merely showed chronic inflammation: (3) the number and percentage of cases in which the lymph nodes in the submaxillary region were the seat of secondary carcinomatous deposits, or showed only inflammatory changes.

Salivary Glands.

It will be seen, therefore, that the actual number of cases of invasion of salivary glands with carcinoma in this series is only two, or 2·5 per cent. It would appear, moreover, that even this small percentage is unduly high, for in a further series of over 40 cases (where, however, no reliable record is obtainable of the microscopic findings on the primary growth) no single case of malignant change in the salivary glands is reported, "chronic inflammatory changes" being noted in most cases. Furthermore, Sir George Makins, appealed to on the subject, writes as follows:—"I have removed many salivary glands in tongue cases, and in early days used to cut them myself. I cannot remember ever to have seen a section showing invasion by epithelioma. You may take this for what it is worth, but I think I should hardly forget if I had ever been familiar with such an invasion."

Pathological Findings.

The salivary glands removed at operation for carcinoma of the tongue, lip, or floor of the mouth have been subjected to detailed examination for the last eight years (exclusive of 1914–18) for evidence of infection with malignant growths secondary to the above-mentioned structures and other changes about to be referred to. In many instances these glands were removed because on clinical evidence they were found to be enlarged and hard.

Carcinomatous invasion of the salivary glands occurs either by direct extension, or secondary to infection of the lymph nodes embedded in the sublingual and submaxillary glands. It is now recognised that hard, or enlarged and hard, salivary glands in association with malignant growths in these regions do not indicate that these glands are infected (although they are often removed at the present day as a preventive measure against the spread of malignant infection). There were only two instances out of a total of 78 cases which we examined for carcinomatous infection of the salivary glands which proved to be carcinomatous on microscopical examination. In one instance the sublingual gland was infected with malignant growth arising from a primary focus in

the tongue, while in the other case the submaxillary gland was infected from a squamous-celled carcinoma arising from the floor of the mouth. In all other instances the salivary glands were normal, or showed varying grades of inflammation with resulting fibrosis at the expense of the glandular tissue. It is not so many years ago when a diagnosis, at operation, of malignant disease of the pancreas, especially of the head of the gland, was made because the gland was considered to be hard from the presence of malignant growth, but as knowledge accumulated on this subject it was found that hardness of the pancreas might be due to inflammatory and fibrotic changes, while cases occurred in which on microscopical investigation nothing abnormal was found to account for the apparent hardness noticed by the surgeon. In like manner a hard salivary gland on clinical evidence may not show either malignant or inflammatory changes.

Naked Eye Examination of the Submaxillary and Sublingual Glands.

The capsule of the glands was in some instances definitely thickened, and thick fibrous septa extended among the glandular elements, thus affording an explanation for the hardness recognised at operation. In few instances contraction had taken place and greatly accentuated the hardness and firmness recognised by the surgeon; on the other hand, no recognisable alteration was detected in some cases. The invasion of the salivary glands with malignant deposits was fully recognised in both our cases before microscopy was attempted. In one instance the fibrosed gland showed diffuse infiltration with malignant growth; in the other it occurred as isolated nodules quite distinct from the hard surrounding tissues. No obvious calculi were met with in any instance (see Microscopy).

Microscopy.

Sections were prepared and stained by various methods considered suitable for the purpose, but it may be stated at the outset that some specimens were subjected to the Levaditi method, but spirochætes were not demonstrated. This line of investigation was undertaken because coarse spirochætes were found to be numerous in sections of a malignant ulcer of the tongue stained by Levaditi's method, and also because a case occurred in which the tongue showed leucoplakia and a large malignant ulcer in which spirochætes indistinguishable from the organism of syphilis were found to be numerous among the epithelial downgrowths, in the inflammatory foci, and among the muscle fibres. The spirochætal findings in the tongue were not, however, as already stated, observed in the salivary glands.

We have adopted, for the submaxillary and sublingual glands removed at operation for carcinoma of tongue, lip, or floor of the mouth the following classification, based on the result of our microscopical findings:—

1. Normal glands.
2. Glands showing considerable adipose tissue replacement.
3. Glands showing varying changes in the interstitial tissue and in the glandular elements detailed as follows:—

(*a*) *Interstitial Tissue.*—Diffuse and localised areas of lymphoid, plasma, and endothelial cells among the glandular elements, with formation of fibrous tissue, in some instances an abundance of plasma cells collected together in clumps was the predominant feature of the sections. Small foci of lymphoid tissue, in which eosins were numerous, are met with in normal submaxillary and sublingual glands, especially round the ducts.

(*b*) *Glandular Elements.*—The serous cells in the normal glands or those glands in which there is ample glandular tissue were packed with coarse eosin staining granules. Reduction in the size and number of the serous and mucous glands is one of the recognised changes subsequent to an inflammatory focus. The mucous glands may be so reduced in numbers that prolonged search may be necessary, or, on the other hand, these glands may be so prominent as to appear to be relatively in excess of the serous glands, while the granules in the serous cells may be invisible or very considerably diminished in numbers. In the early stages of interstitial changes very cellular young fibrous tissue is formed around many acini or maybe around each individual secreting cell. The overgrowth of fibrous tissue, however, may be such that not only are the glandular elements divided and subdivided to the utmost possible limit, but only a few ill-formed scattered islets may remain of the original serous and mucous glands. In extreme cases of this type, the ducts, many of which are dilated, appear unduly prominent. In the lumen of the ducts polymorphs and debris are commonly present, while outside the duct walls an intense inflammation may be observed, especially in the case of the large ducts.

4. Calculus formation has been observed from its earliest stage, in which ill-formed egg-shaped crystals with a very sharp outline and granular contents can be discerned. Such calculus particles lie in and among the abundance of shed epithelial cells in a dilated duct or glandular space—especially the former—serving as an indication of the method of calculus formation, which is similar to that which is known to occur elsewhere.

5. Secondary malignant growths from the tongue and floor of the mouth occurred in salivary glands which were already the seat of chronic inflammation and fibrosis.

6. In addition to the fibrosis of the glandular elements of the salivary glands, thickening of the arterial walls and dense fibrous overgrowth occurs in and around the nerve fibres.

Cases.

As a matter of interest, the two cases, where invasion of the salivary glands by carcinoma was confirmed by microscopy, are quoted in extenso.

CASE 1.—Carcinoma of tongue involving floor of mouth. Male, aged 38 years, admitted with a five months' history of difficulty in swallowing and pain and swelling of the tongue. For a fortnight a swelling had been noted below the jaw. There was no special history of neuralgia. On examination the tongue was found to be enlarged and fixed, with a hard ulcer on the left side. The left submaxillary gland was enlarged, hard, and tender. Teeth very septic. After removal of the teeth, complete excision of the tongue, floor of mouth, and glands was carried out by Regnoli's method. The patient left hospital one month later.

Microscopical Report: Primary growth, squamous-celled carcinoma. Salivary glands: submaxillary, chronic inflammation; sublingual, chronic inflammatory changes and squamous-celled carcinoma in the gland and spreading in along the nerve sheaths. Lymph nodes: carcinoma present.

CASE 2.—Carcinoma of floor of mouth. Male, aged 57 years. Ulcer noticed on left side of floor of mouth for some months, pain and salivation. On examination a large, hard, fixed and ulcerating mass beneath the left side of the tongue extending on to the gum. Extensive glandular involvement of left side of the neck. Growth and glands excised in one mass. Patient discharged, but readmitted later for recurrent glands on left side of neck, which were excised.

Microscopical Report: Primary growth, squamous-celled carcinoma. Salivary glands: in the left submaxillary there was chronic inflammation, with carcinomatous invasion from the embedded lymph nodes. Lymph nodes: carcinoma present.

It will be seen that whereas, in the first case, infection of the salivary gland occurred as a direct extension of the primary carcinoma, in the second case it arose from secondarily infected lymphatics embedded in the gland. A further case is recorded by Butlin,[2] who states: "The submaxillary gland was raised and the lymph glands beneath it dissected out. Recurrence took place in the lower part of the submaxillary salivary gland, presumably due to infection of a lymph gland which had been overlooked." This case again shows invasion of the salivary gland from a metastasis and not by direct infiltration from the primary growth. There is, however, no record of any microscopical examination of this recurrence, which may, therefore, have been an infection from the duct following the operation for the removal of the primary growth in the mouth. It would appear, therefore, that secondary carcinoma in the sublingual and submaxillary salivary glands is of very rare occurrence; the apparent malignant invasion being due to chronic inflammatory changes arising in infective processes travelling from the mouth

via the ducts, and analogous to the changes met with in chronic pancreatitis. Another case of great interest in the series, and belonging to Group A, is also quoted :—

CASE 3.—Carcinoma of tongue. Male, aged 72 years. A feeble man with a large soft fungating ulcer on the left side of the dorsum linguæ; no impairment of tongue movements. Many enlarged and hard glands felt on both sides of the neck. Wassermann reaction +++.

Microscopical Examination of ulcer: Squamous-celled carcinoma.

Block dissection of neck was carried out; patient died of shock.

Microscopical Examination.—Tissues removed included many apparently malignant and much enlarged lymph nodes from all parts of the neck. Salivary glands: submaxillary, chronic inflammation; sublingual, no changes. Lymph nodes (submaxillary, submental, carotid, and infrahyoid): Chronic inflammation, with endothelial-celled infiltration. No evidence of carcinoma.

Here, then, is a case where the extensive removal of chronically inflamed though clinically malignant tissue led to the death of an enfeebled patient who might, and probably would, have survived removal of the tongue alone by the intrabuccal route. Two other cases of an exactly similar nature have recently come under our observation.

Lymph Nodes.

Anatomy.—In regard to the anatomical grouping of the lymph nodes in the submaxillary region, it would appear to follow that described by Stahr[3] and confirmed by Dobson and Jamieson[4] in so far as our observations go. There seem to be, in addition to the normally palpable groups of nodes situated in the cellular tissue around the gland, innumerable small nodes not to be detected by the naked eye under ordinary conditions, but which on malignant or septic infection enlarge and become visible. Indeed, the enlargement and spread of these microscopic nodes of lymphoid tissue, lying amongst the fibro-adipose connective tissue, can be fully observed in pathological processes in the human subject as a result of infection, both septic and malignant.

These superficial nodes, normally few in number, are arranged in two main groups, one around the facial vein and another on a deeper plane between the mylo-hyoid muscle and the deep surface of the anterior end of the superficial lobe of the submaxillary gland. There is, moreover, a third group of glands, not invariably obvious under normal conditions, which must be borne in mind by the surgeon in all these cases—namely, the group deep to the deep lobe of the submaxillary gland and lying along the lingual and vena comes nervi hypoglossi, between the gland and the hypoglossus muscle, just above the great corner of the hyoid bone.

In addition to the above superficial groups four or five nodes occur embedded in the substance of the salivary gland, apparently definitely encapsuled, and usually occurring in conjunction with the interlobular veins. There are, however, in these inflamed salivary glands many areas of leucocytic infiltration, which may well have given rise to the statement that lymph nodes existed in large numbers within the gland capsule. It would appear that all these groups of lymphatic nodes lie without, though closely incorporated with, the capsule of the salivary gland, and that the lobules of the gland overlap and surround the lymph nodes, as they do the veins along which these nodes lie.

Surgical Inferences.

Inasmuch as the group of nodes deep to the deep lobe of the gland drain directly from the side of the tongue, they are presumably much more likely to become infected with carcinoma than the more superficial groups, and inasmuch as their anatomical situation renders them difficult of approach and excision by the surgeon, they are of especial interest in these cases. Moreover, as a result of observations on salivary glands removed, it would seem that in many cases only the superficial lobe is excised, the deep lobe being left in situ with its accompanying deep group of lymph nodes. It would seem from the results quoted in the table that the submaxillary lymph nodes frequently escape carcinomatous infection (71 per cent. in early and 50 per cent. in late cases in this series), though in all cases they show inflammatory changes in and around their substance. This is a point of some practical interest, as it raises the question whether it is justifiable in cases of carcinoma to leave this area untouched, which would preserve the floor of the mouth and lessen both the severity of the operation and the danger of post-operative complications.

In view of the fact that even in early cases there is invasion of the lymph nodes in the submaxillary region in nearly 30 per cent. of cases, it is obviously unjustifiable to leave the area untouched, except under exceptional circumstances, such as in a very debilitated or very aged patient, where it is justifiable to take the risk of the subsequent development of metastases which may follow such conservative measures. Such cases should, of course, be carefully watched for any sign of malignant disease occurring in the nodes in the region after removal of the primary focus. As regards any operation for the conservation of the salivary gland, with dissection and removal of the lymph nodes, the anatomical grouping of the nodes clearly renders their efficient removal impossible unless the salivary gland is also excised, and inasmuch as the removal of this would appear to be followed by no untoward results, there would seem to be no justification for abandoning or even modifying the various operative measures at present in vogue.

Conclusions.

1. That in the vast majority of cases of carcinoma of tongue and floor of mouth the salivary glands are not the seat of carcinoma.

2. That in nearly all cases the changes present in these glands are of a chronic inflammatory nature, somewhat analogous to the changes met with in the pancreas in chronic pancreatitis, and apparently due to infection from the mouth along the ducts. In other cases no microscopic change can be seen.

3. That the lymph nodes in this area show malignant changes in only 27·3 per cent. of early and 50 per cent. of late cases, though inflammation is always present. It would appear, therefore, in certain cases with early carcinoma of tongue to be justifiable to leave the submaxillary area untouched at operation, though clinical experience teaches that the risk of the subsequent appearance of metastases is very great.

References.—1. Butlin, H. T.: Diseases of Tongue, p. 334. 2. Burghard's System of Surgery (Butlin), vol. ii, p. 235. 3 Stahr: Arch. f. Anat. u. Physiol., 1898. 4. Jamieson, J. Kay, and Dobson, J. F.: British Journal of Surgery, vol. viii

PERIODIC ALKALÆMIA WITH ALKALOSIS IN THE ADULT.

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CYCLIC vomiting in children is quite well recognised clinically, but owing to its relative rarity of occurrence and the difficulties of chemical investigation in children there is little definite knowledge as to the metabolism of the condition. For the last 18 months we have had under observation in an adult a condition which clinically appeared to be a metabolic disturbance similar to that recognised in the cyclic vomiting of children. The case was thought worthy of as complete a metabolic study as possible; we have now had the opportunity of making observations during seven attacks, and have investigated the condition from different metabolic standpoints—i.e., liver disturbance, pancreatic disturbance, abnormal carbo-

hydrate metabolism, renal efficiency, intestinal intoxication, &c. Observations of considerable interest have been obtained from work along these lines, and will subsequently be published.

The most fruitful findings, however, have resulted from a study of the acid-base equilibrium of the blood, for they appear to furnish fairly conclusive evidence that the condition present in this particular case is one of alkalæmia with alkalosis, and not of acidosis, as has been generally accepted in conditions of cyclic vomiting. Furthermore, this conclusion is confirmed by the results of treatment directed to counteract the alkalosis.

Clinical Summary of Case.

A. S., male, aged 39, engineer, had always been healthy (except for an attack of acute appendicitis at the age of 30, for which appendicectomy was performed), until four years ago when there commenced a series of "bilious attacks" lasting about a fortnight and separated by intervals of three months or so.

Course of a Typical Attack.—The first symptoms are usually a frontal headache, and feeling of listlessness, and later a dull aching pain in the lumbar region. After a varying interval, sometimes of several days, vomiting of a non-explosive character begins and continues for 4–7 days, while there is a complaint of pain and tenderness across the abdomen above the umbilicus. The attack generally ends with a drowsy semi-comatose condition, lasting 12–24 hours, and usually ushered in by a short period of intense vomiting. The average duration of an attack is 10–14 days, the patient's recovery and return of strength being as rapid as is the onset of the illness. There is associated a moderate degree of fever of remittent type, reaching a maximum of 101°–102° F. and lasting 5–7 days. Pulse-rate lies between 72–84 and respirations average 18–24 per minute. There is no dyspnœa and no air-hunger. There is nothing of special note about the vomitus, which is clear watery fluid, with no great excess of mucus and containing no free hydrochloric acid. Towards the end of the vomiting stage there is a considerable amount of bile present.

Family History.—No history of migraine or of any nervous stigmata can be obtained.

Urinary Findings.—These first suggested to us that a complete study of the acid-base balance of the blood might afford useful information. Acetonuria is constantly present during the whole period of illness in the various attacks. The amount of "acetone bodies" is not excessive, quantitative estimation (Embden's method) giving an average excretion never exceeding 1 g. of acetone plus aceto-acetic acid per 24 hours. We have satisfied ourselves that the acetonuria appears before the factors of fasting and vomiting have time to assert themselves. Thus we have repeatedly noticed that a morning specimen of urine, examined because the man suffered from headache and other prodromal symptoms, might be quite free from diacetic acid (Rothera's test). While a specimen passed in the early afternoon of the same day would give a "quick-strong" reaction, and such a finding was invariably the precursor of a typical attack as described above.

It may be noted that the urine during the intervals between the attacks has been examined at least once a week for the last 18 months, and acetonuria has never been observed except when an attack was imminent.

Remarks.

The most striking feature of the urinary examination during the attacks, from the very commencement of our observations, has been that the ammonia output or rather the ammonia index—i.e., amount of ammonia nitrogen reckoned as a percentage of the total nitrogen—was consistently lower than normal—viz., 2–4 per cent., instead of being considerably increased, 10–20 per cent., or even higher, as in most cases of acetonuria with acidosis.

Davies, Haldane, and Kennaway,[1] in some recent experimental work, have shown that a distinct acetonuria can be produced by the administration of large doses of sodium bicarbonate (30–50 g. per 24 hours). Since, in all previous attacks before coming into hospital, the patient had been heavily dosed with alkalies, by mouth, by stomach tube, and per rectum—the usually accepted treatment for such conditions of recurrent vomiting—and since during the first attack under observation in hospital the alkalies administered were of negligible amount, we wondered whether in view of the low ammonia index, the absence of alkali medication had led to a milder attack than had been previously experienced. Attention was therefore concentrated on a study of the acid-base equilibrium of the blood.

L. J. Henderson[2] has shown that the actual reaction of the blood at any particular time under any particular set of circumstances depends on the ratio: $\frac{\text{Free } CO_2 \text{ concentration}}{NaHCO_3 \text{ concentration}}$. Normally this ratio averages 1/20. When the value is increased, the blood reaction becomes less alkaline than normal, or a condition of acidæmia is produced. This increase in value may be brought about either by an increase in the numerator, or by a decrease in the denominator—i.e., of the alkali reserve—in other words by an acidosis.

On the other hand, when the value of the ratio is decreased, the blood reaction becomes more alkaline than normal—that is, a condition of *alkalæmia* results. This may be due either to a decrease in the numerator—a condition which may result from hyperpnœa, or experimental forced breathing, or to an increase in the CO_2 combining power of the blood plasma, and it is for the designation of this latter condition of increased "alkali reserve" that the name *alkalosis* should be altogether reserved. It is as thus defined that the terms alkalæmia and alkalosis are used in the present paper. A very excellent and lucid account of the modern meaning of "blood reaction," and of the mechanism of its regulation was published recently by Lovatt Evans.[3]

Methods of Investigation Employed.

The data obtained from our investigations of the combined and free CO_2 of the blood in this case of periodic vomiting, corroborate our deductions from the urinary findings. During the three attacks of sickness and vomiting thus investigated a condition of alkalæmia associated with alkalosis has been found to be present.

The methods employed were the following:—1. CO_2 tension of alveolar air: Haldane and Priestley's method.[4] 2. Alkali reserve of venous blood plasma: Van Slyke and Cullen's[5,6] technique. 3. Hydrogen-ion concentration of arterial blood: Dale and Evans's[7] method. 4. Basic and acid phosphates of urine: Leathes's[8] double titration method. 5. Total nitrogen of urine: Kjeldahl. 6. Ammonia nitrogen of urine: Folin, Sovensen. 7. Acetone and aceto-acetic acid: Embden.

Observations Recorded.

In Table I. are given the data of the urinary and blood investigations of attack 6, which bear upon the question of the acid-base balance. The protocols of the previous attacks show similar findings; this one is selected because estimations of the CO_2 tension of the alveolar air and of the alkali reserve of the blood plasma were simultaneously recorded, while treatment by the oral administration of decinormal hydrochloric acid was also carried out.

We also record the data of the blood and respiratory analysis for the succeeding attack (Table II.), as it was the first occasion on which we were enabled to carry out the estimation of the arterial blood hydrogen-ion concentration. The urinary analyses are not tabulated, as the findings are similar to those of the previous attacks.

It will be seen from Table I. that the CO_2 tension of alveolar air is distinctly subnormal—viz., 31·9 mm. and 32·5 mm. in the second and sixth days of illness, as compared with 38·5 mm.—an observation made during the interval of apparent good health. A similar low value—32·1 mm.—was obtained on the fifth day of illness of the next attack before any treatment was exhibited. The "alkali-reserve" of the blood-plasma is high, 72 vols. and 64 vols. per cent., the normal usually being taken as 50–60 vols. per cent. It is to be noted that the alkali reserve of this man appeared to be consistently high—values as high as 78 and 74 vols. per cent. being obtained in a series of observations made while the patient was in normal health. No explanations of these high values can be offered at present. The technique in no

way differed from that with which numerous findings both within the usually accepted normal range and also values below 50 vols. per cent. have been obtained.

We have, however, collected a series of pathological conditions in which the alkali reserve of the blood plasma has been surprisingly high and we hope to be able to correlate these later. Certainly this man exhibits a condition of alkalosis, using the word in its strict sense. It is further seen that the pH of the arterial blood on the fifth day of the attack was distinctly raised, pointing to increased alkalinity, while a normal value was obtained during the period of normal health. It is to be remembered, as Evans [9] has pointed out, that the indicator method devised by Dale and himself gives a pH which is regularly 0·2 higher than that obtained by the electrometric method, the normal blood reaction, according to the latter being taken as pH 7·3–7·5. The values obtained by us in a series of 30 normal cases have been between pH 7·64–7·66, using Dale and Evans's technique.

Thus when we take the ratio $\frac{CO_2}{NaHCO_3}$, as explained above, we find that during the attacks of periodic sickness there is simultaneously a low value for the numerator, and a high value for the denominator—a condition which should be associated with an abnormally alkaline reaction of the blood or an alkalæmia, and the presence of this condition has been demonstrated by direct observation—viz., pH 7·70. As to the urinary acidity, although we have made a full investigation by various methods of both titratable acidity and the actual pH, we are not disposed to lay any stress on the findings, nor to make any deductions therefrom in the present communication. We have, however, recorded in Table I. our findings of the ratio of basic phosphates to acid phosphates, as estimated by the double titration method suggested by Leathes.[8] We do so because they illustrate a phenomenon which we have repeatedly observed in many of the attacks. There is a relatively large excretion of basic phosphates as compared with the acid phosphates during the first few days of the illness, suggesting an attempt on the part of the kidneys to get rid of the abnormally high "alkali reserve." This is followed by a sudden reversal of the ratio to the more normal state of affairs when the basic phosphates amount to ½–¾ of the acid phosphates. This is well shown by the figures recorded in Table I., where basic-acid ratios $\frac{114}{100}$, $\frac{158}{100}$, $\frac{285}{100}$ on the second, third, and fourth days of illness, are followed by ratios of $\frac{58}{100}$, $\frac{69}{100}$, $\frac{77}{100}$.

We also made another observation which we think worthy of note in connexion with this condition of altered acid-base balance of the blood. For four or five weeks before the probable date of an attack of vomiting, &c., we carried out a fractional test-meal examination (Rehfuss's meal) each Sunday morning. The several findings showed nothing of special note except the variations in type and height of curve for total acidity and free HCl which may occur from week to week in the same individual. On the morning of the last examination of our series the man seemed to have a heavy lethargic look, and on questioning him, he admitted suffering from headache and feeling "off colour" for the previous 24 hours. Examination of the urine revealed a definite acetonuria, which marked the beginning of a typical attack. The interesting point about the gastric analysis on this the first (or at most the second) day of the attack, was the high total acidity and free HCl—considerably higher than in any of the previous test-meal examinations. Thus a total acidity of 70 (measured in terms of c.cms. N/10 NaOH per 100 c.cm. gastric filtrate) was maintained during the second hour of the test-meal examination, while the maximum height of the total acidity curve in the previous three examinations had ranged from 25–50. This depletion of acid from blood and body tissues would all tend to accentuate the condition of alkalosis.

TABLE I.—*Attack 6.*

	Day of illness.							During normal period.
	2nd	3rd	4th	5th	6th	7th	8th	
Urinary output (c.cm.)	265+	750	515	310	390	415	760	—
Total N (g.)	5·245	13·314	6·489	7·490	8·736	8·146	17·875	—
Ammonia N (g.)	0·126	0·504	0·158	0·217	0·398	0·365	0·875	—
Ammonia index (%)	2·4	3·8	2·4	2·8	4·5	4·5	4·9	4·6
Acetone + aceto-acetic acid (g.)	0·039	0·080	0·150	0·194	0·413	0·083	nil.	nil.
Alkali phosphates	114	158	285	58	69	77	70	68
Acid phosphates	100	100	100	100	100	100	100	100
Alkali reserve of venous blood plasma (vols. %)	72	—	—	—	64	—	69	74
CO_2 tension of alveolar air (mm.)	31·9	—	—	—	32·5	—	35·6	38·5
Decinormal HCl administered (c.cm.)	50	50	100	200	200	200	200	—

TABLE II.—*Attack 7.*

Date.	pH arterial blood.	CO_2 tension alv. air.	Alkali reserve venous plasma.	Remarks.
4/4/22 (fifth day of illness).	7·7	32·1 mm.	67%	No attempt at treatment up to this time.
21/4/22 ..	7·65	—	78%	Patient had felt quite well for 10 days.

Treatment with Decinormal Hydrochloric Acid.

On the strength of the above observations pointing to an abnormally alkaline blood reaction, the patient was treated during attacks 5 and 6 with moderately large doses of decinormal hydrochloric acid. The difficulty was to get the patient to take the desired amount, owing to the repeated vomiting. From the second day in attack 5, and the fifth day in attack 6, he took 200 c.cm. N/10 acid (110 ℥ Ac. hydrochloric. dil. B.P.). These attacks lasted six and seven days respectively, and were shorter than any of those occurring during the last two years. It has to be recollected, however, that it is exceedingly difficult to change the "alkali reserve" of the blood by ingestion of hydrochloric acid by the mouth, although the acid and ammonia excretion per hour is thereby increased. Recently, J. B. S. Haldane [10] has demonstrated that an acidosis can be experimentally produced by the administration of ammonium chloride. This salt appears, in part, to undergo changes in the body, the ammonia going to form urea, thus setting free some hydrochloric acid, and aiding the production of an acidosis.

During the last attack observed—attack 7—an attempt was made, from the fifth day of illness, to treat the patient with this drug (240 gr. per 24 hours). Unfortunately, however, it was found that the irritable condition of the stomach would not tolerate one quarter of the above amount, even in small and frequently repeated doses, and a much more satisfactory result was obtained by the exhibition of hydrochloric acid as described above in the two previous attacks.

Although a condition of alkalæmia with alkalosis appears to have been conclusively demonstrated in this case of recurrent or cyclic vomiting in an adult, we are very far from suggesting that this is the type of acid-base derangement always present in cases of cyclic vomiting. The very fact that treatment by alkalies, especially when administered very early in

the attack, leads to beneficial results in many cases of recurrent vomiting in children is satisfactory evidence that a condition of acidosis may also occur. We suggest, however, that a disturbance of the acid-base balance towards the alkaline side instead of towards the acid side may also occur, and indeed may be more common than is supposed in various conditions of toxæmia.

To the clinician acetonuria has usually suggested acidosis. We now know, as Davies, Haldane, and Kennaway[1] have demonstrated, that acetone bodies may appear in the urine as the result of the administration of large doses of alkalies; while the case under review shows that they may be associated with an alkalæmia. We would also suggest that an investigation along similar lines of various conditions of metabolic disturbance may prove fruitful in revealing a swing of the acid-base balance to the alkaline side. Mention may be made, for example, of certain toxæmias of pregnancy associated with vomiting, of which Gilliatt and Kennaway[11] have given a full account. They give records of their own cases and cite those of Ewing and of Whitridge Williams, which, owing to the unexplained low or even subnormal ammonia index, have frequently been considered of "neurotic" origin as contrasted with those showing an abnormally high ammonia index.

A study of migraine, and indeed of a simple "bilious attack," might also be of interest, while an explanation of some of the unsatisfactory results following the administration of large doses of alkalies in certain conditions of acetonuria may thus be afforded. Although a condition of alkalæmia with alkalosis has been demonstrated in this case of cyclic vomiting, we have to admit that, so far, we are no nearer the discovery of the definitive cause of those periodic attacks associated with this change of the acid-base balance of the blood.

Conclusions.

1. A case is described of periodic vomiting in an adult, aged 39, which has continued over a period of five years. In addition to a constant acetonuria during the attacks, the other notable feature of the urinary examination is an abnormally low ammonia index.

2. Investigations of the blood and alveolar air show that during the attacks of sickness there is a low hydrogen-ion concentration of the blood, a low CO_2 tension of the alveolar air, and a high CO_2 combining power of the blood-plasma—in fine, a condition of alkalæmia with alkalosis.

3. Treatment with large doses of decinormal hydrochloric acid, to counteract this abnormal alkaline reaction of the blood and body tissues, gave satisfactory results; the administration of ammonium chloride was unsuccessful owing to vomiting being immediately induced.

4. The clinical association of acetonuria with a condition of alkalæmia is thus demonstrated, and corroborates the similar experimental findings of Davies, Haldane, and Kennaway.

5. It is possible that these findings afford an explanation of some of the unsatisfactory results following the administration of large doses of alkalies in certain conditions of acetonuria; while it is suggested that some of those metabolic disturbances—e.g., certain types of the toxæmia of pregnancy—in which a low ammonia index has been associated with severe clinical symptoms may be due to the swing of the acid-base balance of the blood to the alkaline side.

In conclusion, we desire to express our thanks to Dr. G. W. Watson, physician to the Leeds General Infirmary, for his kindness in handing the case over to us and in placing a bed at our disposal for conducting our observations during the several attacks of illness. We wish also to express our indebtedness to Prof. M. J. Stewart, in whose department the work has been carried out; to Prof. H. S. Raper, of the Physiology Department, for valuable assistance and advice; and to Miss E. M. Hickman for help in carrying out some of the later investigations.

(*Continued at foot of next column.*)

THE SCOPE OF VACCINE THERAPY.[1]

BY C. E. JENKINS, M.R.C.S. ENG.,
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THE utility and limitations of vaccine therapy are questions which resolve themselves into a consideration of two interdependent factors—the patient and the vaccine. It will be convenient to discuss them together. All cases which can be treated by vaccines are divisible into three main groups; the division is of more importance than mere academic classification, for the success of the treatment will often depend upon the discrimination of the clinician or the bacteriologist in allotting a case to its correct group. The first group comprises the cases in which cure or alleviation of a disease actually present is desired. To the second group belong that large mass of healthy people who require a vaccine for prophylactic purposes—that is to say, to acquire protection against some disease which may attack them at a future date. The third group is the one which causes confusion. To it belong the cases which require prophylaxis primarily, but which at the same time are in need of cure.

The Suitable Cases.

Group 1.—It is a commonplace that the two cardinal requirements of a successful vaccine are that the disease it is proposed to treat shall be a bacterial disease, and that the vaccine shall be prepared from the causal organism. Even so, success cannot be guaranteed. Other subsidiary factors, although separately of small moment, exert collectively a very important influence upon the final result. First, the patient's condition must be capable of improvement, for no vaccine can repair, or rather recreate, a tissue already completely destroyed. Thus a vaccine will frequently benefit a case of long-standing chronic bronchitis to the extent of abolishing the dyspnœa, asthmatic attacks, cough, and that anæmia which frequently accompanies the condition. But it cannot be expected to cure the emphysema, the presence of which is a standing and irremovable threat of future trouble if the patient becomes too confident of his powers of resistance and therefore careless. It is hardly necessary to observe that such factors as age, opportunity of rest, and undermining of resistance by long toxic absorption all count in the ultimate result. Alcoholic excess is a well-known predisposing cause of bacterial invasion, both acute and chronic, but it has often to be pointed out to the patient that whilst the vaccine may cure his present illness it is unlikely to confer upon him what he would regard as the high privilege of a permanent and absolute immunity from all the unpleasant effects of strong drink.

Another type of case often benefited by vaccine therapy comprises those sufferers from a disease in which one sets out frankly to treat a secondary infection or a complication, leaving the primary cause to the patient to deal with as best he may. Such conditions as the valvular lesions of the heart complicated by chronic bacterial pulmonary infection are of this nature. The fact that in most cases the cardiac lesion had a bacterial origin is beside the point. The damage has been done, the causal organism has disappeared, and all one can do is to mitigate the damage. Pulmonary tuberculosis of what is called the "open" type is another example. Here the primary disease is complicated by secondary

[1] An abstract of a post-graduate lecture delivered at the Salford Royal Hospital.

(*Continued from previous column.*)

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infection by the common parasitic organisms of the respiratory tract, and the patient's chance of recovery is not rendered any easier thereby. If the secondary sepsis can be removed a better opportunity is afforded for fibrous healing to occur.

The isolation of the causal organism may be simple or a matter of much difficulty, such difficulty lying in the identification of causation rather than in the trouble to obtain a growth of the suspected organism in a culture. The intestinal tract furnishes the most conspicuous example. There are many toxic conditions which are due to the fæcal streptococcus, and a culture of the fæces occasionally yields a growth which puts the question beyond doubt. An instance was a profound toxæmia accompanied by an erythematous eruption and liquid stools of appallingly offensive odour. A culture yielded a mixed growth of the streptococcus and a diphtheroid bacillus, with complete absence of the colon bacillus. A vaccine produced a complete recovery. But the majority of the cases are not so simple. It is usual to find the streptococcus and the colon bacillus present, and the problem to be solved is to decide whether either of them can be fairly described as being present in abnormal numbers or as having unusual characters. An example of the latter was a purulent colitis of unknown origin in which two distinct types of colon bacillus were recovered. A vaccine made from the aberrant form was highly successful. It is obvious that each and every case must be decided upon its merits, and the bacteriologist must guard himself well against an imagining of vain things.

Group 2.—The conditions that govern the composition and use of prophylactic vaccines are of a simple order. It is required to protect a patient from the risk of contracting any disease or group of diseases at some future date. It is therefore essential that the vaccine shall contain all organisms likely to cause infection, and in stating this requirement one may draw attention to the importance of using in the vaccine several strains of each of the organisms. The duration of the immunity so conferred is variable, but twelve months is the minimum for most organisms. The subject of immunity is one which the patient should have explained to him. All immunity is only relative, and whilst it is probable in a given case that the inoculated person will be absolutely free from attack, yet it is by no means certain, and the patient should realise that such is the case. On the other hand, it may be promised with some certainty that any attack that may occur will be mild in type and of short duration.

Group 3.—Much the commonest clinical condition belonging to this group is recurring catarrh of the respiratory passages. The type of case which requires vaccine treatment for catarrh is large in numbers and shows much variety in the clinical nature of the most prominent symptoms. The typical case complains of a nasal catarrh or a bronchitis that varies greatly in intensity with the weather and the season: occasionally he is quite free from it, but the slightest exposure brings it back as an acute attack to be followed by weeks or months of chronic rhinitis or bronchitis, the latter being commonly associated with asthma. The constant drain upon the patient's resistance gradually brings about a general lowering of his health, vigour, and capacity for work.

The question of a vaccine is usually considered when the patient has reached this stage, and he generally presents himself for examination by a bacteriologist shortly after an acute attack. A copious nasal discharge or sputum is still present and seems to invite forthwith a culture and an autogenous vaccine. It is a mistaken policy. A purely autogenous vaccine is the correct type to employ as a curative measure for the infection then existing, but if it is expected to exercise a prophylactic power against future attacks it implies that one expects all subsequent infection to be due to the same organism, and that the patient has a special susceptibility where that organism is concerned. A very little experience will suffice to demonstrate that, except in a few rare instances, this is not so. The patient's weakness does not lie with a solitary organism; it is a general lack of resistance on the part of his respiratory tract against bacterial infection in general. Therefore a vaccine should be designed to cover all the organisms commonly encountered as infective agents of the tract, and since it is desirable to combat the immediate infection as well, a semi-autogenous vaccine, composed of the organisms recovered at the moment and combined with a good multi-strain stock vaccine of the other organisms, is the vaccine most likely on theoretical grounds to give the best results. Practical experience has convinced me that the theory is sound.

This method of preparing a vaccine is particularly useful in the treatment of chronic rheumatism and rheumatoid arthritis, where the preparation of a vaccine is always somewhat empirical in spite of such discoveries as a gratifying purity of streptococcal growth obtained from a pocket of pyorrhœa. The proportions in which a semi-autogenous vaccine is compounded afford scope for individual preference on the part of the bacteriologist, but three-fifths of the autogenous organisms with two-fifths of the stock will be found very generally useful.

Dosage.

The dosage of vaccines is still a controversial subject. It may be considered with reference to three points—the amount of the dose, the intervals between doses, and the total number given. It is neither desirable nor necessary to produce a really serious constitutional disturbance. The therapeutic result will be no better at the end of the course, whilst an initial general reaction of considerable unpleasantness may make the patient disinclined for any further injections. These considerations therefore impel one to conclude that it is sound policy to give doses which produce at most nothing more than a few hours' "tired feeling" after each of them. The intervals between the doses should be from five to seven days. A clinical improvement is often seen in a shorter time, but the patient is hypersensitive for three or four days after each injection, and may develop a profound reaction if the interval is made as short as two days. The number of injections should not exceed eight. Prolonged courses frequently produce a state in which the patient fails to react to any dose. The final degree of improvement shows itself about three weeks to a month after administration has ceased. If a second course is deemed desirable later, an interval of four or five months should elapse before commencing it. There are many types of vaccines, but only two need notice. The first is the old simple vaccine, most used at present; the other is the residual, or detoxicated, vaccine, which is challenging the supremacy of the first-named. The residual vaccine has many practical advantages, and I have yet to see a case in which the old type is preferable, or even equal, to the residual vaccine in the improvement it produces.

The Relationship of Vaccine Therapy to Other Forms of Treatment.

As a general rule a vaccine is a last resort, only invoked when other means have failed or offer no reasonable prospect of benefit. But the fact that these other remedies are in themselves not sufficient should not cause them to be abandoned when vaccine treatment is started. Each reinforces the other and contributes to the only result that matters—cure. This combined treatment is seen at its best in acute and chronic gonorrhœa. The residual vaccine is the best single remedy, but it would be folly not to assist it with the older remedies appropriate to the condition.

Lastly, vaccines are being used to-day with increasing frequency as preparatory remedies for increasing the prospect of success in operative work where urgency is not indicated. At present this field of usefulness is almost confined to the surgery of the nose and throat, but the field might well be widened. It is scarcely necessary to add that the cases in this field belong to the third group, and that the most suitable vaccine to use is the semi-autogenous.

Reviews and Notices of Books.

THE HEART AS A POWER CHAMBER.

A Contribution to Cardio-Dynamics. By HARRINGTON SAINSBURY, M.D., F.R.C.P., Fellow of the Physiological Society; Consulting Physician to the Royal Free Hospital and the City of London Hospital for Diseases of the Chest. London: Henry Frowde and Hodder and Stoughton. 1922. Pp. 248. 12*s*. 6*d*.

Dr. Sainsbury's book will appeal both to the physiologist and to the clinician. The subject is not treated from a purely physiological aspect as the title might suggest. The earlier chapters are devoted to a discussion of certain problems concerning the normal circulatory mechanism, the basis of the argument being chiefly anatomical. This leads up to a consideration of the modifications to which this mechanism is subject in disease, and the rational treatment of heart failure. Of particular interest are the arguments put forward to support certain hypotheses relating to the sequence of contraction of the ventricular fibres and the normal mode of functioning of the aortic valve. The importance of auricular systole in mitral stenosis also receives special consideration. Certain criticisms of the generally accepted interpretation of the venous pulse are based on what appears to be a false hypothesis, namely, that the "V" wave is due to an impact occurring during the early phase of ventricular systole.

Although one may not be prepared to agree with all of Dr. Sainsbury's conclusions, his book contains many attractive theories, and the evidence in their support is admirably presented.

INFANT MORTALITY.

Second edition. By HUGH T. ASHBY, M.D., Visiting Physician to the Manchester Children's Hospital, Pendlebury; Consulting Physician to the Manchester Infant Welfare Centres, &c. Cambridge: University Press. 1922. Pp. 224. 15*s*.

IN the preface to the first edition of this book, published in 1915, the author stated that one of the main objects of its issue is to stimulate interest in the difficulties with which many mothers have to contend; the desire to help them without relieving them of their responsibility. The preface to the second edition points to the good work already accomplished and instances the successful way in which we came through the hot summer of 1921 as an example. At the same time the need for better midwifery, more antenatal supervision, and a better and cleaner milk for infants are insisted on.

The ramifications of the problem of infant mortality are now so many that it is not much wonder that the author has been unable to deal with the subject adequately in small compass. The management of breast-feeding, now an art in itself, is dismissed in six lines on p. 46. Something more recent than the Salford instructions on infant management for 1914 might with advantage have been included in the appendix. Suckling every two hours during the day and every four hours during the night can hardly be classed as up-to-date advice. The author's attempt to avoid controversy was obviously doomed to failure since rickets was one of the subjects to come into his survey, and his confidence that good feeding will render a child immune to rickets may well be shaken by modern exponents of the environmental theory. We doubt if there are any good grounds for thinking that the baby's chance is less if the mother is over 35 years of age, as is stated on p. 29. The Rowntree pre-war standard of poverty referred to in Chapter IV. requires revision.

With the author's views on the way to tackle the housing problem, on the functions of health visitors, on creches, and on the prevention of ophthalmia neonatorum we do not altogether agree, nor do we consider it quite fair to claim advantages for milk pasteurisation in reducing infant mortality while ignoring those of dried milks. But we have no doubt that the author's object—to awaken more interest in the prevention of infant mortality—was achieved by the first edition, and that the second edition will continue to stimulate effort in this direction.

THE THYROID GLAND.

Clinic of George W. Crile and Associates. Edited by AMY F. ROWLAND. London and Philadelphia: W. B. Saunders Co., Ltd. 1922. Pp. 288. 24*s*.

THIS work is not intended to be an exhaustive treatise on the thyroid gland. It is rather an account of the pathology, diagnosis, and treatment of the diseases of the thyroid founded on the observations of a number of writers, each of whom, working on his own lines in Prof. Crile's clinic, views the problem from his own special angle. The result is a composite picture painted by a large and competent team, who present an interesting, if individual, view of the subject. The book is described in the preface as an "ephemeral publication," and no guarantee is given that views expressed in it may not shortly be altered or reversed. This quality gives the work a topical flavour, which makes it very interesting to read, though no reader with much knowledge of the subject will find himself able to refrain from frequent criticism. Prof. Crile is himself responsible for putting forward an electro-chemical theory of thyroid function, and has written the more surgical parts of the book. Several of his contributions have already been published elsewhere. Other sections describe the histology and classification of thyroid tumours, their prophylaxis, differential diagnosis, and treatment by X rays, clinical tests for hyperthyroidism, and a discussion of the value of basal metabolic rate determinations. Some important points not usually referred to, such as the relation between diseases of the thyroid and laryngeal function, are also fully dealt with.

The volume is a stimulating study of a subject now very much in the foreground both of medicine and of surgery.

COLLECTED PAPERS.

Institute of Physiology, University College, London. Vol. XX. Edited by ERNEST H. STARLING, C.M.G., M.D., Sc.D., F.R.S.; W. M. BAYLISS, M.A., Sc.D., F.R.S.; and J. C. DRUMMOND, D.Sc., F.I.C. (Privately circulated.) 1922.

THE previous issue of collected papers from this laboratory was made in 1914–15. The present collection of 42 papers, most of them published in the past two years, represents the results of much hard and careful work, and we are glad to see such a variety of problems so successfully tackled. Of researches which have a bearing on the practical problems of medicine, we may mention the fine investigations of Dr. Drummond and his collaborators on the vitamins; in our opinion these studies are among the best that have yet been made. The experiments by Sir William Bayliss on the use of gum acacia solutions to replace blood are already well known, and these, with his other papers on blood reaction and on colloids, form physiological contributions of permanent value. Mention should also be made of a most original paper by Dr. G. V. Anrep on the metabolism of the submaxillary gland. The whole collection is of the same high standard of excellence as that of the previous volumes of a similar nature from this active centre for physiological research. Prof. Starling for various reasons has been unable himself to contribute much to the present volume, but his guiding hand is evident in papers by his assistants. Now that he has returned to active laboratory work, doubtless before long we shall learn of interesting and fruitful results. His lecture on the "Circulatory Changes Associated with Exercise," which is printed in the present set of reprints, is an excellent and convincing summary of the splendid series of investigations carried out with various collaborators just prior to the war.

THE TUBERCULOSIS CLINIC.

By Several Writers. Edited by NOEL D. BARDSWELL, M.V.O., M.D., F.R.C.P. London: John Bale, Sons and Danielsson, Ltd. 1922. Pp. 111. 6s.

THIS short book fills a small but serious gap in the equipment of tuberculosis officers, for whom it is specially designed. The information he needs is sometimes scattered through a number of text-books and manuals, or is not to be found in the written word, having to be picked up either by personal experience or from the casual confessions of his senior colleagues. Let there be no mistake about it; the new tuberculosis service is full of pitfalls, clinical and administrative, and however warily and gingerly the tuberculosis officer walks, he must be capable of being all things to all men if he is not to flounder badly.

In the commencing chapter Dr. S. Roodhouse Gloyne gives a useful summary of the modern laboratory diagnosis of tuberculosis. There follows a chapter on the clinical diagnosis of tuberculosis by Dr. G. T. Hebert, whose opinion of the "anamnestically-minded" diagnostician is happily conveyed in the following sentence:—

"When the second tuberculosis officer explains what great help towards diagnosis he obtains from the history of symptoms, the first can but often envy him and concentrate his faculties on other methods of investigation."

His appreciation of the X rays is of a somewhat similar character. The third chapter, by Dr. H. Hyslop Thomson, is a review of the tuberculosis clinic in rural districts. The tuberculosis clinic in urban districts is dealt with in the fourth chapter by Dr. R. C. Wingfield, who gives the tuberculosis officer sound advice as to the attitude to adopt towards local practitioners:—

". . . . He must lay himself out to gain their confidence, and . . . . show them that he is in office as their servant . . . . and he will fail in his duty if he is regarded by them as an interfering person whose only aim in life appears to be to badger them to fill up forms and to steal their patients and interfere with their treatment."

Dr. Wingfield also discusses the often strained relations between general hospitals and tuberculosis dispensaries:—

"At present the hospital and the dispensary do not seem able to share a patient . . . . if the tuberculosis officer were to take the trouble to study the peculiarities of the hospital in question, instead of expecting it to be run exactly like the hospital at which he was trained, ... he would get from it valuable and . . . . generous help."

Later chapters deal with the classification of cases and record forms. Dr. Bardswell is to be congratulated on his selection of a staff obviously in intimate contact with present-day tuberculosis problems, and though his choice has not fallen on writers full of years, honours, and strictly pre-Georgian knowledge, the value of this book is unmistakable.

JUVENILE DELINQUENCY.

By HENRY HERBERT GODDARD, Director, Ohio Bureau of Juvenile Research. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1922. Pp. 120. 3s. 6d.

THE first chapter in this book is a sensible exposition of the problem of delinquency; hope is expressed that ultimately prevention will be the order of the day. Unfortunately this excellent introduction is not followed by any serviceable information. As a result of three years' work the writer has discovered an unexpected problem in the "psychopathic child" as distinct from the feeble-minded child; the diagnosis of the psychopathic child is largely, though not exclusively, based on the word-association test, an inadequate account of which is given. It is curious that the writer did not recognise this problem earlier, and that he does not realise that a medical psychologist should be able to pick out most of these children in the course of a mere ordinary examination. The word-association test is a crude and mechanical approach to the unconscious mind; possibly it is the stereotyped use of such methods that has prevented the writer appreciating the factors in the make-up of many delinquent children that have been recognised by other workers on this subject.

Mr. Goddard pins his faith to elaborate records, and gives several tables, which must have taken much time and care to compile, but lead nowhere. For instance, in a table showing the "principal findings" of the Ohio Bureau of Juvenile Research, of which the writer is the director, we find that out of 460 patients examined six required circumcision; only the fact is recorded, and we are left uncertain whether the disability tended towards delinquency. The fact that 20 others had been circumcised seems to show at least that the operation does not prevent delinquency. Equally useless is the statement that 10 were "pretubercular"; the term is meaningless, as is also the bald record that "262 urinalyses were made," and 14 of these were positive.

Enough has been said to show how unscientific the book is, even if we ignore the fact that without any substantiation the writer suggests, though he does not actually state in so many words, that the most important cause of delinquency is congenital syphilis. It does not seem to have occurred to him that syphilis is only one of the racial poisons, all of which must be taken into account, and which include alcohol, of which he makes no mention; nor does he appear to perceive that before accepting such an explanation we must know the percentage of syphilis among the non-delinquent juveniles of the same class and up-bringing. It does not come as a surprise that the only psychological treatment recommended is a form of suggestion. The psychopathic delinquent is to be told repeatedly that he has a brain that does not function properly, and therefore must be careful not to get into awkward situations, to which only normal minds are equal. The records in this book make us wonder how far America is wise to give the direction of such work to a non-medical psychologist.

THE AMERICAN ILLUSTRATED MEDICAL DICTIONARY.

Eleventh edition. Revised and enlarged. By W. A. NEWMAN DORLAND, A.M., M.D., F.A.C.S. London and Philadelphia: W. B. Saunders Company, Ltd. 1921. Pp. 1229. 35s.

THE eleventh edition of Dorland is said to contain several hundred new definitions, most of which, the preface adds, are not to be found in any other dictionary. Without endorsing a comparison the accuracy of which it would be difficult to establish within the lifetime of an edition of any popular work of reference, we gratefully recognise the help afforded to the medical practitioner in whatever sphere by the admirable up-to-dateness of Dorland's dictionary. There has certainly been no "let-up," as Dorland terms it, in the coinage of new terms, and in the fields of biochemistry, endocrinology, immunology, and neurology the reader would soon be at sea without such help as this dictionary affords. But we should be glad to see justice done to Mr. William Banting, who, as we have already pointed out, was an undertaker and not a physician, although his pamphlet on Corpulence, published in 1863, was a useful piece of medical work, and the Germans have credited him with a medical diploma.

The production of this dictionary must have become a labour of love to the staff which produce it, for something more than conscientiousness is required to produce any work so compendious and so accurate.

PSYCHOLOGY AND MENTAL HYGIENE FOR NURSES.

By MARY B. EYRE, R.N., President, Colorado Board of Nurse Examiners, &c. New York: The Macmillan Company. 1922. Pp. 208. 7s.

THIS book is written for general nurses and not especially for those in charge of mental patients. It covers a large field, giving an outline of such conceptions as attention and memory, reason and will, with

an account of psycho-pathology and psycho-analysis, and their practical applications. The psychology of childhood and that of industry each receives a chapter, and there is a full description of the Simon-Binet tests. Plenty of common-sense advice is given in psychological language, and one welcomes the plain statement (pp. 78 and 123) that sex habits in children are very much more common than is usually supposed, and should not be met by scolding, which breeds concealment and fear. The writer might have added that remorse connected with masturbation is a common and potent factor in the production of neuroses, even in adult life, and that any addition to the fear so often accompanying the habit is pernicious in its results. Undue emphasis upon the anatomical side leads to the idea of "making strong new brain paths which will inhibit the old ones" (p. 57), an idea which is hardly psychological, and can only be taken as a metaphor.

The book will give nurses a useful acquaintance with the many branches of a subject which is becoming of some clinical importance.

THE MIDDLE GAME IN CHESS.

By EUGENE ZNOSKO-BOROVSKY. London: G. Bell and Sons. 1922. Pp. 226. 10*s.* 6*d.*

THE well-known Russian master points out that, while there is much literature concerning chess openings and end games, there is practically no work dealing with the most important and complicated part of the game—that frequently a player fails to understand or to utilise the advantage he has obtained or how to construct a plan or for what to strive. The author's aim in this book has been to work out the problems of valuations of position and the construction and execution of plans. He demonstrates superior, equal, and inferior positions; the advantages and inferiority of force which is displayed in the pieces, of time developing with the moves, and of space represented by the board. There are 100 diagrams mostly taken from actual play. Though the first portion of the book is devoted to the elements of chess, the control of pieces, the essentials of the game, and the openings, it is probable that the beginner who does not propose to study the subject deeply will be content with a less elaborate text-book. But the work cannot fail to be of great interest to all students of the game, including those who are already strong players.

JOURNALS.

BRITISH JOURNAL OF CHILDREN'S DISEASES. July-September.—In an article on the Effect of Special High Protein Diets in the Treatment of Chronic Intestinal Indigestion in Children, Dr. Alan Brown, Miss Angelia M. Courtney and Miss Ida F. MacLachlan record the results of their investigations at the Nutritional Research Laboratories of the Hospital for Sick Children, Toronto, and the Department of Pediatrics of the University of Toronto. Their cases were divided into three groups, namely (1) mild, (2) moderately severe, and (3) severe, this last group representing the classical type of chronic intestinal indigestion or intestinal infantilism of Herter. In the first group in which there were four cases, ranging in age from 2 to 5 years, the chief symptoms consisted of looseness of the bowels with definite evidence of fermentation, general lack of tone, and fatigue with restless sleep. A mild degree of anæmia was also present. There was a record of excessive feeding with breadstuffs and sweets. The response to moderate high protein diet with lactic acid milk took place in about six to nine months' time. In the second group, in which there were six children aged from 18 months to 5 years, the symptoms of carbohydrate indigestion were exaggerated and there was pronounced evidence of undernutrition with distension, so that a more rigid exclusion of carbohydrates from the diet was required, and recovery took from six months to a year longer than in the first group. In the third group, in which there were nine cases, the children presented varying degrees of emaciation with greatly distended abdomen, lack of growth, physical and mental fatigue, and a moderate degree of anæmia. The previous history of these patients consisted of repeated digestive upsets, usually associated with diarrhœa and invariably connected with a high carbohydrate diet. Treatment consisted in keeping the children on an exclusive protein diet until the stools showed no evidence of fermentation and lost their acid reaction. Carbohydrate foods were then added gradually until a full diet was reached. The writers point out that the prominent feature in chronic intestinal indigestion is fat intolerance. As this cannot be overcome in the presence of excessive fermentation, such as is present in all these cases, a diet was selected to reduce the process of fermentation to a minimum, consisting of protein or lactic acid milk, curds, meat, cheese, and gelatin. This method was employed in seven cases with invariably satisfactory results. Tables are given showing the results of investigations on metabolism in three cases.—The second part of the paper on the Severe Blood Diseases of Children: A Series of Observations from the Hospital for Sick Children, Great Ormond-street, by Dr. F. John Poynton, Dr. Hugh Thursfield and Dr. Donald Paterson, is devoted to a consideration of leukæmia, the chlorotic type of anæmia in children, and lymphadenoma.—The abstracts from current literature deal with papers of surgical interest.

INDIAN JOURNAL OF MEDICAL RESEARCH.—The July number contains contributions to medical pathology and entomology.—Lieut.-Colonel W. F. Harvey continues his synopsis in tabular annotated form of bacteriological and laboratory technique.—Major W. S. Patton writes short papers on entomological subjects: a note on the occurrence of the larvæ of *Philæmotomyia crassirostris*, Steinx, in the human intestine. This fly is a blood-sucking muscid, and the eggs are normally hatched in fresh cow-dung. The patient probably became infested during a Brahmin ceremony. The second contribution is upon two cases of cutaneous myiasis caused by the larvæ of *Sarcophaga*; the third a note on the egg-laying habits of *Cobboldia elephantis*, a stomach bot, the egg masses of which are found attached to the tusk close to the lips; the fourth on the value of a tame cow for collecting blood-sucking diptera; the fifth, systematic descriptions of new Indian species of *Musca*.—The most important contribution in this number is the lengthy memoir by Major F. W. Cragg upon the epidemiology of relapsing fever in the United Provinces of Agra and Oudh.—Lieut.-Colonel W. F. Harvey and Captain K. R. K. Iyengar contribute two papers on bacteriological subjects. The first, a short note, deals with the retention of virulence of a micro-organism kept in sealed culture; the second, a study of the influence of age and temperature on bacterial vaccines, in which they conclude that a fowl cholera vaccine does not deteriorate when exposed to these vicissitudes.—Major J. A. Sinton has three papers upon plasmodia; in the first two he describes an improved method of culturing *Plasmodium falciparum* in sealed tubes; and in the third curious attenuated developmental forms of a plasmodium, differing from *P. falciparum*, and possibly identical with *P. immaculatum*, Grassi and Feletti, previously described by Stephens as *Plasmodium tenue*. The paper is illustrated by means of microphotographs and drawings in which the resemblance to Stephens's figures is well demonstrated.—Mrs. Adie has a short note illustrated with a plate of microphotographs on bodies observed in *Cimex rotundatus* collected in a kala-azar infected area in Assam. These are the bodies whose relationship to leishmania has been suggested.—Lieut.-Colonel J. W. Cornwall and H. M. Lafrenais write upon a new variety of streptothrix cultured from a mycetoma; and, finally, F. W. Edwards (British Museum) commences his systematic synopsis of the adult oriental culicine mosquitoes.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT GLASGOW.

(*Continued from p. 520.*)

SECTION OF OTOLOGY.

WEDNESDAY, JULY 26TH.

AT this section the earlier part of the morning was devoted to a discussion on

Septic Sinus Thrombosis: its Diagnosis and Treatment,

which was opened by Sir WILLIAM MILLIGAN (Manchester), who confined himself mainly to the question of diagnosis, leaving the treatment to the other opener. He pointed out that although the more attractive part had fallen to Mr. Colledge, nevertheless the diagnosis was the more important of the two. His paper, in which the pathology of sinus thrombosis, so far as it relates to diagnosis, was fully discussed, was mainly a plea for early diagnosis, for on this success in treatment entirely depends. As he said, "To await the development of the full array of classical signs and symptoms is merely to court disaster," and again, "Too much stress is frequently laid upon the absence of rigors." The two chief points to which Sir William Milligan thought more attention should be paid in order to establish the diagnosis early were a more careful scrutiny of the temperature chart combined with a more frequent record and a more careful and systematic ophthalmoscopic examination.

Mr. LIONEL COLLEDGE (London) dealt with some difficulties presented by cases of sinus thrombosis. The difficulties in diagnosis from malaria, typhoid fever, and other intracranial complications were illustrated by various cases. The difficulties in reaching a decision as to treatment were also discussed, especially the question as to whether the jugular vein should be tied. Two extreme schools still exist, one of which declares that all operations on the vein are useless or even worse, whilst others advocate ligature in every case, and in fact supporters of both these views were not lacking at the meeting. Mr. Colledge held the opinion that the truth must lie somewhere between these extremes, and if the objects in view—namely, to provide free drainage for any septic material in the sigmoid sinus, bulb, or jugular vein, and, secondly, to cut off the escape of septic material into the general venous circulation—were kept in mind, the selection of cases where operation on the vein was indicated should not be difficult. He advocated the operation which Sir Charles Ballance recommends, whereby the upper end of the divided vein is brought out on the surface of the neck, and allowed to drain freely.

Mr. T. RITCHIE RODGER (Hull) followed with a paper on Thrombosis of the Cavernous Sinus, in which he described two more cases in addition to the four he has already reported. The two latest were due to spread of infection from the sphenoidal sinus, where the mucous membrane was found to be gangrenous. He drew attention to the fact that only one of his six cases was of otitic origin.

In the discussion which followed these papers Prof. HOLGER MYGIND (Copenhagen) gave valuable and interesting statistics of 144 cases of lateral sinus thrombosis, probably the largest number yet recorded by a single observer. He described the stages of his experience regarding the ligature of the vein, and stated that he is now inclined to employ it only when there is pus in the jugular bulb, so that the upper part of the vein may serve as a drainage-tube.

The discussion was carried on by Dr. WILLIAM HILL (London), Sir JAMES DUNDAS GRANT (London), and Mr. F. F. MUECKE (London), especially regarding the treatment. Mr. Muecke gave his experience of over 100 cases operated on by Mr. Hunter Tod and himself at the London Hospital He had come to the conclusion that it is safer to tie the jugular above the common facial in every case. Dr. ANDREW WYLLIE (London) advocated intravenous injections of 1-2000 solution of corrosive sublimate in septicæmia. Dr. W. S. SYME (Glasgow), who mentioned a case of spontaneous cure of sinus thrombosis; Dr. DOUGLAS GUTHRIE (Edinburgh), who mentioned two unusual symptoms—namely, pain on swallowing in the region of the tonsil and unilateral sweating on the affected side; and the PRESIDENT, Dr. ALBERT GRAY (Glasgow), who mentioned the danger of injuring the wall of a healthy sinus by strong antiseptics, especially eusol, also took part in the discussion.

Dr. J. S. FRASER and Dr. STEPHEN YOUNG (Edinburgh) read a paper entitled

"Is it Worth While to Remove Aural Polypi?"

Dr. Fraser described the technique with local anæsthesia now employed in Edinburgh for removing polypi, and emphasised the difficulty of ascertaining the point of origin of an aural polypus. The general conclusion which had been reached after an extended experience was that a polypus might be removed once, but that if it recurred it was better practice to do the radical mastoid operation.

In the discussion on this paper cases in which alarming accidents had followed the removal of aural polypi were related. Mr. MUECKE, however, drew attention to the impossibility of admitting every patient with an aural polypus for a radical operation, and therefore held that as a practical measure removal still has a place.

The afternoon session was devoted to a paper by Prof. MYGIND on

Benign Forms of Otogenic Meningitis.

This was the most important contribution to the proceedings of the section, and is perhaps the most valuable report on the subject of otogenic meningitis that has appeared in recent years. Dr. Mygind gave in this paper his experience of the benign forms of otogenic meningitis, based on 210 cases of all forms of otogenic meningitis treated in the aural department of the Copenhagen Commune Hospital during the last 17 years. Careful statistics were given relating to age, and the presence of other intracranial complications, so that the factors which tend towards the progress or arrest of meningitis are thus exhibited in statistical form. Dr. Mygind dealt fully with his experience of 2000 lumbar punctures and the importance of the cell count in the examination of the cerebro-spinal fluid. The general characters of the cerebro-spinal fluid in the benign and malignant forms of meningitis were described. The number of cells which constitute a pleocytosis, on which the diagnosis of meningitis can be based, has been variously estimated. Dr. Mygind places it as low as three or more cells per cubic millimetre and regards between two or three as suspicious. With three or more he regards the diagnosis of meningitis as certain, and shows good reason for his opinion.

For cases of otogenic meningitis with clear cerebro-spinal fluid the name of "collateral meningitis" is preferred to the terms meningitis serosa, meningitis localis, meningitis sympathetica, or meningeal irritation. This term avoids a name which involves a distinct interpretation of the character or the extension of the disease. It also expresses the dependence of the process upon a primary focus and also its tendency to recede when the primary disease is cured by operation or passes into a subacute state. The importance of the early elimination of the primary focus was insisted on, whether this be in the middle ear alone, in the petrous bone, or the labyrinth. During the last ten years Dr. Mygind has come to the conclusion that this is the all-important factor in dealing with the cases, and believes that the various methods of draining the meninges employed during the previous seven years were useless and even injurious. He believes now that if elimination of the primary focus, combined with lumbar puncture, does not stop the development of meningitis, nothing else will do so.

SECTION OF LARYNGOLOGY.

THURSDAY, JULY 27TH.

THE subject chosen for discussion at the one-day meeting of this section—namely,

Diseases of the Œsophagus: their Symptomatology and Differential Diagnosis,

was introduced by Dr. D. R. PATERSON (Cardiff) and Mr. WALTER G. HOWARTH (London). As far as possible the former confined his remarks to affections of the upper opening of the gullet, whilst the latter dealt with those of the lower segment. Dr. PATERSON indicated that what may be termed the œsophageal syndrome is comparatively simple, consisting essentially of two symptoms, dysphagia and regurgitation of food. If the obstruction is high, fits of coughing may accompany attempts at swallowing. The dysphagia, being largely related to spasm, is very variable and may be transitory, and this relates even to organic disorders, for example, malignant disease. Other symptoms of less value are painful burning sensations or feelings of tension or constriction. Continuous pain increased by swallowing is often associated with malignant disease. Salivation may be reflex from a traumatic lesion around the introitus, or may be due to actual obstruction.

Turning to diagnosis, palpation should be internal as well as external. Laryngoscopic examination is indispensable as is also the use of the fluorescent screen. For the latter the patient should be in the oblique position with the head and upper part of the body turned half to the left and the right shoulder in contact with the screen. The shadows of the spine, heart, and aorta are then displaced and a good picture of the bismuth meal is obtained. Endoscopy is now well established as a routine method of examination, whilst suspension-laryngoscopy is especially adapted for examining the post-cricoid region. The element of spasm runs through all the pathology of the œsophagus and there has probably been a tendency to exaggerate its importance as a primary condition. In women about middle age spasm of the upper opening, gradual loss of weight and anæmia, associated with a smooth glossy tongue and dryness of the mouth, pharynx, and upper part of the œsophagus, form a definite clinical entity, which is unrelated to nasal and laryngeal disease and is often the precursor by many years of malignant disease in the post-cricoid region.

Mr. HOWARTH drew attention to the impossibility of presenting a clinical picture pathognomonic of any single condition. In all types, though not all cases, dysphagia is the prominent symptom. Pain, referred to the cricoid or the back of the sternum, regurgitation of food, useless cough, persistent hiccough, choking sensations and a feeling of suffocation are often noted, but any or almost all of these symptoms may be absent. Dysphagia to solids is more usual in organic strictures and to fluids in achalasia and allied conditions, but this is not always so. Persistent hiccough may be a valuable early symptom of malignant disease, but it may also be the first indication of achalasia. The earliest symptoms of disease in the lower half of the œsophagus may be referred to the upper end, so that a choking attack may be the first warning of disease in the phreno-cardiac segment. In X ray examination by the screen, thick bismuth emulsion is better than the bismuth cachet, which may be misleading from the spasm which it excites. In the diagnosis between organic and functional stenosis at the lower end the shape that the bismuth takes is important. In the nervous group the shadow is very broad, regularly conical or with a rounded end that bends to the left and projects below the cupola of the diaphragm; often no bismuth passes into the stomach even if the examination is continued for half an hour. The conical form may be difficult to distinguish from malignant stenosis, but in this the cone is not of a regular smooth outline and is often irregularly notched; there is, moreover, a gradual leakage of bismuth into the stomach. The hypodermic injection of atropine or especially papaverine may cause almost immediate relaxation and allow the bismuth to pass rapidly into the stomach. It is upon œsophagoscopy that reliance must be placed for the exact diagnosis of most conditions, for by it alone can the mucous membrane be inspected and the exact situation of an obstruction be determined.

Dr. A. BROWN KELLY (Glasgow) confined his remarks to the question of cardiospasm and described the appearances observed in the hiatal region by means of the œsophagoscope. From his observations he considers it proved (1) that the obstruction at the lower end of the œsophagus is really due to spasm; (2) that the predisposing cause is a condition of irritability of the œsophageal muscle fibres, or their controlling mechanism, above the hiatus; (3) that the endoscopic appearances are against the theory of achalasia.

Much discussion took place around the question whether primary spasm occurs in the œsophagus. Dr. WILLIAM HILL (London) maintained that a great majority of cases of supposed primary spasm eventually prove to be cases of malignant disease, and described primary spasm as an extra-metropolitan disease, seldom or never seen in London. Dr. W. S. SYME (Glasgow), on the other hand, considered spasm in the lower part of the œsophagus by no means rare, and could not support the opinion that 95 per cent. of cases of œsophageal obstruction were due to malignant disease. Sir WILLIAM MILLIGAN (Manchester) mentioned experiments and clinical observations in support of the view that cardiospasm is caused by spasm of the left crus of the diaphragm. Some cases have been relieved by physiological division of the left phrenic nerve.

Mr. A. J. WRIGHT (Bristol) gave a description of two cases of

Congenital Occlusion of the Posterior Choanæ.

This occurred in two sisters, aged 14 and 15 respectively. Three other younger children were normal. The occlusion was complete and bony in both cases. Great difficulty was experienced in feeding the children during infancy. Although they had of necessity been complete mouth-breathers from birth, the skeletal and other changes were not at all pronounced. The palate was rather high, but the nasal passages wide and the septum straight. The chest was well developed and the intelligence good. Removal of the occluding bone and posterior end of the nasal septum was successful in either case. The partial degree of obstruction to nasal breathing and the infection associated with adenoids would therefore seem to be more injurious to the individual than complete nasal obstruction with absence of infection.

Dr. HENRY HALL FORBES (New York) read a paper on the

Use of Radium in Malignant Disease of the Larynx and Œsophagus.

Dr. Forbes quoted numerous reports and statistics from American clinics and gave a report of his own intensive study of this question during the last three years. He put forward a strong plea for coöperation between the endoscopist and the radiologist, since the latter can bring to bear on the problem experience in dosage and in the effects on other parts of the body. He gave also a demonstration of the apparatus employed in the technique of this form of radium therapy.

In discussing this paper Dr. HILL emphasised the necessity of radiating the whole length of a malignant stricture, not merely a section of it; he showed how this should be done and drew attention to the defective character of some forms of apparatus still being supplied. Sir WILLIAM MILLIGAN, who has had access to a large quantity of radium at Manchester, confessed to disappointment at the results of treatment by radium in this special line of work. He thought that much further study as to dosage, technique, and the selection of suitable cases was required and received the support of Sir STCLAIR THOMSON, who protested against the use of radium in operable cases of malignant disease.

SECTION OF DERMATOLOGY.

WEDNESDAY, JULY 26TH.

AT the first session of this section, Dr. LESLIE ROBERTS (Liverpool) being in the chair, a discussion on the

Ætiology of Seborrhœa

was opened by Dr. R. CRANSTON LOW (Edinburgh), who affirmed the principle that the term seborrhœa should be restricted to an oily discharge from the sebaceous glands. This was often associated with hyperidrosis. Although bacilli were constantly found associated with this state, yet in all probability the condition was functional and not inflammatory; sometimes it was existent at birth, a gap in its incidence was found until puberty, when it became a common affection. Underlying recognisable factors that influenced the seborrhœic state were diet, clothing, toxins, and dys-function of the endocrine glands. Excess of sugar in the diet, a faulty carbohydrate metabolism, and a too large intake of milk fats could not be neglected. The name of Darrier cannot be dissociated from the seborrhœic state, his outlook has been confirmed by recent work by Semon and Barber. Apart from true oily seborrhœa often associated with acne, the conditions of seborrhœa capitis, sicca, and steatodes are well recognised. Ordinary baldness is commonly attributed to seborrhœa, but the lecturer attached great importance to the loss of the stimulus of weight, by keeping the hair short. The wind blowing through the locks is a stimulus to the growth of hair. In cases where the disease is widely spread, the presence of sensitisation to some protein has to be considered. In some such cases autogenous vaccines have proved useful in treatment.

Dr. H. W. BARBER (London) said he had been investigating this condition since 1917; it was of common occurrence in the army. A clear distinction must be drawn between seborrhœa and superadded states of secondary infection. An excessive greasiness of the skin can be a familial and a racial characteristic, but in a pathological seborrhœic state the secretion is altered in composition as well as in quantity. When the secretion is diminished as in icthyosis, seborrhœa may still be found. Resistence to infection of the skin is undoubtedly lowered in some cases of seborrhœic eczema, the serum has been found to agglutinate the staphylococcus from the lesions in a dilution of 1 in 200. In addition to autogenous vaccines, he recommended large doses of alkalies, inasmuch as experimentally he had demonstrated a diminished alkali reserve—figures of this were given. Hyperglycæmia may be found in the seborrhœic state higher in amount when there was a superadded pus infection, but sugar in the urine was very rare. Outstanding features of the seborrhœic state were a faulty carbohydrate digestion and an excessive carbohydrate intake, too little fresh fruit, hepatic insufficiency, particularly after salvarsan injections, imperfect oxidation, lack of exercise, and anæmic states.

Dr. R. W. MACKENNA (Liverpool) acknowledged how much the preceding papers had thrown light on an obscure subject. He agreed that the alkali reserve was lowered. Attention must be given to the rôle of the endocrine glands. Baldness in particular he associated with a disturbed function of these glands.

Dr. W. KENNETH WILLS (Bristol) emphasised the infective element in seborrhœic dermatitis. Children with this complaint were accompanied by parents or nurses with marked seborrhœa capitis.

Dr. A. DOUGLAS HEATH (Birmingham) had seen improvement from large doses of alkalies, and in making up sulphur lotions an alkaline medium aided their action.

Dr. A. M. H. GRAY (London) urged the primary importance of defining seborrhœa or "superficial catarrhal dermatitis"; he stressed the hereditary factor in alopecia, and considered that too little was known to let us dogmatise about the precise bearing in these cases of the glands of internal secretion.

Dr. NORMAN WALKER (Edinburgh) advised the frequent washing of the scalp to prevent baldness; the treatment of the scalp was the key in the treatment of seborrhœic conditions, above all, of rosacea and in acne vulgaris.

Dr. W. J. O'DONOVAN (London) concurred in the importance of racial and biochemical factors particularly in such inveterate states as sycosis barbæ in Jewish patients. In such cases vaccines, alkalies, and repeated epilations with X rays had failed, but relief had followed painting with acid nitrate of mercury. Perionychia was a not infrequent primary focus of infection.

Dr. H. BROWN, Dr. G. H. LANCASHIRE, and Prof. J. GOODWIN TOMKINSON contributed to the discussion.

The PRESIDENT stated that research should follow three main lines—clinical, comparative anatomy, and biochemical. There was an association between seborrhœa and the condition of moulting in the lower animals.

Dr. G. H. LANCASHIRE (Manchester) read a short paper on

Dermatitis Artefacta.

He referred to the constant association of palatal anæsthesia, &c. Apart from cases of malingering, which was rare, and hysteria, there was a group of cases that were on the borderline of insanity. The psychogenic factor should be sought for, and the help of the psycho-analyst might be invoked.

Dr. NORMAN WALKER mentioned the compelling power these patients had of attracting sympathy, which put the doctor at a disadvantage in dealing with them. After diagnosis, the dermatologist would be well advised to transfer them to a neurologist for proper treatment.

THURSDAY, JULY 27TH.

Dr. O'DONOVAN read a paper on

Industrial Dermatitis,

illustrated by numerous photographs. In skin diseases more than in any other branch of medicine an endeavour was constantly made to find or exclude an occupational cause. A general inquiry as to occupation was useless, the patient was often ignorant of the substances he handled daily, and a trade description, such as a fitter or driver, did not indicate the industrial hazard. A wide view of these cases was only obtainable by the Home Office medical inspectors of factories. Rubbing and constant friction produced hyperkeratoses and carcinomata, the incidence of the latter being hastened by the coexistence of syphilis or tuberculosis of the skin; he related a unique case of cancer of the finger due to the annular friction of a wedding ring. Dusty and dirty work was not a cause of dermatitis, but, per contra, cleaning with water was a most potent cause of industrial eczema, and its incidence and severity were heightened by the addition of weak acids or alkalies. Other cleansing fluids, such as benzene, naphtha, turpentine, were causes of eruptions in most cleanly people. In the food industry he had seen noteworthy cases of barley itch, and a gang of workers showed a profuse papular eruption due to the *Carpoglyphus passularum* from mite-infected figs. Sugar itch and baker's itch were in his local experience rare. Formalin used in preserving paper had caused a small factory outbreak of "eczema." Dermatitis due to chrome and to phosphorus was very difficult to cure. In any new industry people with intolerant sensitive skins must be eliminated early and relentlessly, so that a permanent force of "salted" workers might be obtained. The parallelism between tar dermatitis and carcinoma and the ill-effects of X rays on the human skin was very close. The conditions of work in engineering workshops favouring the outbreak of oil rashes was illustrated by reports on several factory inspections.

Dr. T. M. LEGGE (London) said industrial dermatitis was essentially a clinical problem. Masterly inactivity

by administrators was often rewarded by closer clinical observation, and meddlesome interference was avoided by coöperation between factor and local doctors. He classified industrial dermatitis as due to: (1) definite chemical irritants; (2) substances which dissolved the natural fat from the skin; (3) maceration; and (4) mechanical injury. In his experience chronic ulceration was common, but he had yet to see a carcinoma developing from chrome lesions. The wash basin is not the cure or sole preventive of industrial dermatitis. Suitable greasy preparations should be supplied to make up for the fat lost to the skin, or protective powders might be used.

Dr. NORMAN WALKER inculcated always the need of a precise inquiry into occupation. Coöperation with the Home Office was of the greatest assistance; in this way only had the ill-effects of paraffin been overcome in his own district. Idiosyncrasy was an important and permanent factor in the worker's skin.

Dr. FREDERICK GARDINER (Edinburgh) stressed the importance of underlying pathological states of the skin and of preceding illnesses. Slight alterations in a factory process will cause an outbreak of dermatitis. A large proportion of cases start early in the patient's employment; some may not develop for years. Among his skin patients 66 per cent. of the cases seen were due to occupations, and in 14 per cent. the dermatitis was due to a definite illness.

Dr. LANCASHIRE said that the possible occupational causes of skin irritation were legion. He had seen dermatitis among dentists due to handling novocain.

Dr. WILLS said that like Dr. Norman Walker he had seen linseed oil dermatitis; he, too, had noted how dirty people escaped dermatitis. He was sure that anything which had a drying action on the skin was deleterious. In an outbreak of barley itch which he investigated he found in the skin papules the barbs of a plant that were mixed amongst the grain. He related an interesting case of a patient whose hands and skin were proved by experiment to be sensitive to hemp.

The PRESIDENT laid great stress on there being an underlying general cause for local skin affections. He divided the causal factors into (1) a deficiency in the external defence, and (2) some idiosyncrasy, probably chemical in its nature. Preventive applications called for great care in their prescription.

Prof. J. GOODWIN TOMKINSON read a short communication relating a family incidence of alopecia areata. Out of 11 members, 8 suffered with alopecia areata of varying degree, and of these 7—as shown in a photographed group—had strabismus, while neurotic symptoms could also be elicited; no stigmata of heredo-syphilis were present. This unique record provoked a keen discussion, wound up by the PRESIDENT.

The meeting on Friday was preceded by a large exhibit of rare and interesting cases, while in the pathological museum was a well-arranged exhibit of skin drawings, photographs, and microscopical preparations.

SECTION OF DISEASES OF CHILDREN.

WEDNESDAY, JULY 26TH.

THE first day of the section was devoted to the joint discussion with the Section of Physiology on the Ætiology of Rickets, which has already been reported (THE LANCET, August 19th, p. 392).

THURSDAY, JULY 27TH.

On the second day, under the presidency of Sir HERBERT F. WATERHOUSE (London), a discussion on the

Treatment of Tuberculosis of the Cervical Glands

was opened by Mr. JOHN FRASER (Edinburgh), who said there were few subjects on which there was such a wide divergence of opinion as the treatment of tuberculosis of cervical glands. Nevertheless, he hoped that in the course of the discussion some general agreement might be reached. It should be possible to formulate a group of common-sense rules which would guide the practitioner in his advice to the patient. He distinguished between cases where the tubercle bacillus had reached the glands via the blood and those in which the infection was limited to lymphatics. The latter comprised 90 per cent. of the cases, and in them the disease might remain localised for a long time. Clinically the localised form could be distinguished by the fact that the process began in one gland and spread to those adjacent, whereas in the type due to blood infection there was coincident appearance of mutiple diseased glands in areas not connected by lymphatics. As long as the disease remained localised it could be cured by thorough removal of the affected glands. On the other hand, operation in the generalised type was of no use and should not be performed. The tubercle bacillus gained entrance through the tonsil in 80 per cent. of the localised lymphatic cases, through adenoids in 12 per cent., and through carious teeth in 8 per cent. Except when periadenitis was present the infection was purely tuberculous and not complicated by the presence of pyogenic organisms. Tuberculosis of cervical glands was essentially preventable. The sources of infection were milk and human open tuberculosis. As regards treatment we knew of no remedy which would eradicate the disease except surgical operation. Thorough removal should be done whenever possible and as early as possible, but there were certain contra-indications—namely, a blood-borne infection, the fibrous type of the disease (in which operative difficulties were very great), where incision and curetting had previously been done, and in children under 1 year of age. In addition he would not operate during the stage of periadenitis, and if the child was suffering from tuberculous toxæmia he advised a preliminary course of tuberculin injections.

The PRESIDENT agreed with nearly every point that Mr. Fraser had brought forward. Tuberculosis of cervical glands in the majority of cases was a local infection, and the patient was cured if they were radically removed. Often the condition appeared to subside, but broke out afresh when resistance was lowered by intercurrent disease. Operation should be undertaken early. He wished to protest against the use of X rays in cervical tuberculosis. He himself had never seen a cure, but had had numberless cases where operation had been rendered extremely difficult owing to their employment.

Mr. G. GREY TURNER (Newcastle) considered that the bad results obtained 20 years ago in cases of cervical glands were due to the fact that no attempt was made to differentiate between local and general tuberculous disease. Permanent cures were obtained by operation in the majority of cases in the localised type. The tubercle bacillus gained entrance via the tonsil very early in life, often under the first year. He had no objection to operating in young children. Operation in babies under 1 year was easier than in older subjects though attended with slightly greater risk. Evidence that tuberculous glands could be cured by means other than surgical was very slight. The after-history of a series of cases 5 to 18 years after operation showed very satisfactory results. The cosmetic effect was good if cases came early.

Mr. ALEXANDER MITCHELL (Aberdeen) thought that the prevalence of tuberculous glands in Edinburgh and Aberdeen was due to infected milk. The Government should have power of dealing with tuberculous cattle. The systematic removal of diseased tonsils and adenoids which had followed the medical inspection of schoool children had resulted in a considerable decrease of glandular tuberculosis. He agreed that all cases could be cured by thorough dissection of diseased glands, but thought that curetting was preferable in a few patients. He would dissect after scraping if necessary.

Dr. HUGH THURSFIELD (London) said that tuberculosis of cervical glands was not so prevalent in London as in Edinburgh. Too much stress should not be laid on bovine tuberculosis. There was danger that by so doing the numerous cases infected from a human source might be overlooked. The cases which ended

in generalised tuberculosis were most often due to the human bacillus.

Mr. ALEX. MACLENNAN (Glasgow) emphasised the need for a proper supervision of the milk-supply. Tuberculosis of cervical glands nearly always began as a mixed infection. The pyogenic organisms present in tonsillitis or rhinitis paved the way for the entrance of the tubercle bacillus. Treatment must depend on the individual patient. It was impossible to formulate rules. The speaker then showed a series of lantern slides illustrating different types of cases.

Mr. L. A. PARRY (Brighton) spoke of the importance of prevention. A supply of milk free from tubercle bacilli and attention to tonsils, adenoids, and teeth would do much to diminish the incidence of the disease.

Dr. A. A. WARDEN (Paris) said that all the speakers had treated the subject from the surgical point of view, whereas he considered that Rollier, of Leysin, and Sir Henry Gauvain had shown that a large number of cases could be cured by heliotherapy. The problem was a social and economic one and until tuberculous milk was banished treatment was futile.

Mr. H. N. FLETCHER (Brighton) remarked that since heliotherapy was not generally available tuberculous glands must be dealt with in some other way. He believed in excision whenever possible. Aspiration in his hands had not yielded satisfactory results.

Miss G. HERZFELD (Edinburgh) had investigated the after-history of 100 cases operated on by her. There had only been one recurrence. Out of 330 cases 48 per cent. were apparently cured without operation. She did not use tuberculin or X rays.

Dr. E. J. MACKENZIE (Manchuria) gave her experience of tuberculous glands in China. There was no bovine tuberculosis because the people did not drink milk, but human tuberculosis was very common. Girls suffered more than boys because they led an indoor life.

Dr. D. SMITH expressed the opinion that surgeons did not often see the first stage of the disease. It usually began as an acute streptococcal tonsillitis. The tuberculous infection supervened on this. He had had good results from aspiration of single glands in 45 per cent. of cases.

SECTION OF ANATOMY.

FRIDAY, JULY 28TH.

The President, Prof. ALEXANDER MACPHAIL, in declaring this section open, said that he was very glad that the Association, whenever it could, included anatomy among its sections. He paid tribute to the work of Prof. JOHN CLELAND, who occupied the chair of anatomy in Glasgow for 32 years, and suggested that it would be the wish of the section to send him a greeting expressing their esteem and affection. The administration of the Anatomy Act formed the subject of his address. Medical students had been seriously hampered in their work by shortage of material. He explained the steps he had taken to remedy this. There was no question of introducing any form of compulsion in the disposal of bodies. Only unclaimed bodies were asked for, and when the persons who had the disposal of these understood for what purpose they were required prejudice was usually overcome.

Prof. J. C. BRASH (Birmingham) read a paper on the relation of the ureters to the vagina. Owing to variations in the relation of the uterus to the bladder the ureters were often asymmetrically placed with regard to the vagina. The height of the trigone varied with regard to the cervix and the trigone was often deviated to one side or the other, usually to the right. This brought the terminal portion of the left ureter in close relation to the lateral fornix and to the cervix. Sometimes the left ureter actually passed across the mid-line of the cervix before entering the bladder. In these cases the risk of injury during operation or from pressure of a tumour was materially increased. The asymmetrical position of the uterus was explained as due to pressure on this organ during the latter part of pregnancy by coils of fœtal intestine distended with meconium.

Dr. ALFRED PINEY (Birmingham) had investigated the naked-eye anatomy of the bone marrow in 1700 post-mortem cases. All the bones except those of the cranium contained red marrow until puberty when a small mass of fat appeared just below the centre of the shaft in the long bones. This spread until only a small patch of red marrow was left at the proximal end of the shaft. At the same time a similar fatty change went on in the epiphyses. In the marrow of the vertebræ and ribs fat was very uncommon. He described the blood-vessels of the marrow. In common with other observers he had been unable to discover any lymphatic supply.

Dr. J. M. W. MORISON (Manchester) described the method of teaching anatomy by radiology as it was carried out in the anatomy department at Manchester.

Dr. W. B. PRIMROSE (Glasgow) in describing his researches on the structure of the vertebrate head said that since the time of Goethe the anatomists had tried to work out a modified vertebral structure for that of the vertebrate head. He intended to show that structure of the vertebrate head was based upon the first metameric segment of the body with which was combined an unsegmented structure, the face. The skeleton of the head consisted of four morphologically distinct skeletons:—

1. The sclerotome skeleton which was formed at the time when the somatic or body wall mesoderm became segmented for the purpose of acting upon the segmented hydrostatic or water skeleton contained in the cœlomic sacs in the annelida. When the hydrostatic skeleton disappeared, the septa separating the cœlomic compartments remained and gave attachment to the body wall muscles. Cartilage was deposited in them. In fishes they became the sclerotomes and formed incomplete arches. The anterior segment of this skeleton was represented in the head by the occipital and hyoid bones.
2. The axial skeleton which was developed from the notochord. It formed the basi-occipital and the basi-sphenoid.
3. The splanchnic skeleton which appeared when the respiratory organs were developed. It formed the greater cornu of the hyoid and the laryngeal, tracheal, and bronchial cartilages.
4. The facial skeleton; this was evolved in connexion with the organs of special sense and was unsegmented.

The speaker then explained the development of the muscles, blood-vessels, gut derivatives, and nerves with relation to the head segment. He concluded that the head was a primitive segment which had been subject to extreme specialisation during development.

Dr. W. K. CONNELL read a paper on observations on the form of the palate in children. He took an impression of the upper dental arcade in plasticine and studied the variations in shape found in normal and abnormal conditions, the changes which took place during growth and the relation of the size of the arch to the state of development of the child. Contrary to what might be anticipated he found no alteration in the arcade in children with adenoids. He also found that there was no connexion between the size of the child and the size and shape of the palate.

Dr. J. I. HUNTER (Sydney) described a case of intestinal diverticulum with retroposition of the transverse colon. A large loculated cyst was present in the mesentery of a child who died seven days after birth. He attributed this to the closing off of a duodenal diverticulum arising during development and microscopical examination confirmed this hypothesis. The retroposition of the transverse colon was due to the proximal part of the gut having been bound down by the cyst and therefore unable to assume its proper position during development.

DONATIONS AND BEQUESTS.—The Manchester Royal Infirmary has received from Mr. Robert McDougall, in memory of his father the late Alderman McDougall, a donation of £5000 for the equipment of the new extension of the X ray department of the infirmary. Other donations included a legacy of £1009 from the late Miss Violet Harker of Ashton-under-Lyne, £2475 from the British Hospital Commission, £573 from the Queen Alexandra Flower Carnival, and over £270 from other donors.

THE LANCET.

LONDON: SATURDAY, SEPT. 9, 1922.

Body and Mind.

THE annual meeting of the British Association provides opportunity for the leaders of the army of science both to survey the ground won by advancing knowledge and to indicate what lies beyond, and in his presidential address at Hull, to which he gave the title "Some Aspects of Animal Mechanism," Sir CHARLES SHERRINGTON has admirably filled this double function. In his account of recent work he shows that the secret of the coördination of reflexes may lie not in the view that the nerve centres possess their own various kinds of mechanism, but in the simpler explanation that they act only as meeting places of nerve fibres, their properties being only those of nerve impulses in combination. Here is a simple mechanism, but when he views the original growth or repair of the nervous system he finds that the how of its working is chiefly traceable in the steps of its results rather than in comprehension of its intimate reactions, though those who are closest students of it still regard it as a mechanism. If we admit that every item of the body's organic machinery runs on physical and chemical rules, will the living animal, he asks, present no other problematical aspect? Our acquaintance with other minds than our own can only be by inference, yet when we assess as a whole even a single animal life we must not forget that body and mind are set together. Here Prof. SHERRINGTON faces the age-old problem that sooner or later meets every biological worker. Mentality, in the usual acceptance of the term, is not distributed broadcast throughout the nervous system, but restricted to the relatively newer portions of the forebrain; but, as he points out, the mental parts of the brain exhibit no striking change of structure at the places of transition from the non-mental region, though to pass from a nerve impulse to a psychical event is a step from one world to another—and an incommensurable one. Yet there are many points of contact. The mental reaction of each type of emotion is accompanied by a more or less characteristic nervous discharge; nervous exhaustion and mental exhaustion mingle; habit formation is both mental and nervous; in short, the features of the two sets of actions resemble each other over and over again, and the relation of structural change, or destruction, of certain parts of the brain to mental derangement or defect is a commonplace. The nexus between the two sets is strict, but for comprehension of its nature we still require, it seems, comprehension of the unsolved mystery of life itself. Prof. SHERRINGTON sums up in simple language, and with scientific humility, when he says that we cannot at present deal with mental actions in terms of nervous actions, or vice versa, and that the practical man has to accept nervous function as a condition for mental function without breaking his heart over ignorance of their connexion. These simple generalisations should exclude from practical medicine the attempt to describe mental processes in terms of nervous mechanism, together with philosophical speculations as to monism and the rest, which soon lead into the deep sea of metaphysics.

It is Prof. SHERRINGTON'S conception of the integrative action of the nervous system that gives us the point at which the psychologist takes up his particular task. The special office of the nervous system is to bring the body's component parts into one mechanism reacting as a unity to the world about it; with its progressive development the mind has also step by step developed, and the more far-reaching the reactions of the mind the more need there is for their consolidation. It is to the psychologist that we must turn, says Prof. SHERRINGTON, to learn in full the contribution made to the integration of the animal individual by mind. The view that regards hysteria as a mental dissociation illustrates by contrast the integrative action of the total healthy mind, for when conflicting trends can be harmonised, rather than ignored so that they escape from the sway of the conscious mind, there is a gain in personal coherence of the individual. But integration proceeds beyond the individual, and the combining of individuals into a community is due to the nervous system's crowning attribute, the mental. The biological study of this integration also is essentially psychological. The choice of his theme was partly due, Prof. SHERRINGTON tells us, to the late Dr. RIVERS; that being so, we are grateful to one who had himself gone far to bring psychology into harmony with other biological sciences. Psychology is now in a fluid state that marks activity and progress, and living contact is necessary between it and medicine; for the maintenance of this scientific unity we look to the integrative action of such wide views as those of the president of the British Association.

Treatment of Neurosyphilis by Artificial Leucocytosis.

THE correspondence columns of our last issue contained a letter from Prof. OSKAR FISCHER of Prague, animadverting on a brief note from our Special Correspondent there in reference to the former's treatment of tabes and general paralysis of the insane by nucleinic acid. Under the name "phlogetan" Prof. FISCHER has introduced a preparation of nucleo-proteins, as we learn from his letter, which in his opinion has already given essentially better results than any of the older procedures in nuclein therapy. For the sake of those who may not be conversant with the subject it may be remarked that nuclein therapy for the supposedly intractable varieties of neurosyphilis known as tabes dorsalis and general paralysis is based on the occasional clinical observation that these are clinically benefited should an intercurrent fever or infection develop. Data, apparently convincing, have long been familiar to the expert, and have led to experimentation with malaria, tuberculin, the organism of recurrent fever, and sodium nucleinate. In each instance the idea behind the procedure was to produce an artificial pyrexia with accompanying leucocytosis in the hope and belief that the course of the primary infection—viz., the neurosyphilis—would thereby be favourably modified. Tuberculin has been almost entirely abandoned; in Austria Prof. VON JAUREGG is dosing his general paralytics almost as a routine with subcutaneous injections of malarial blood and is claiming long remissions as a result, if not actual "cures"; as regards the nucleinate preparations, the experience of various continental observers and of Sir JAMES PURVES STEWART,[1] among others, in England, is or has been, generally speaking, only moderately encouraging.

Now Prof. FISCHER comes forward and claims for "phlogetan" an improvement on all other techniques

[1] See THE LANCET, Sept. 2nd, p. 513.

for the production of artificial leucocytosis, stating boldly in so many words that cure can be reached in clinically certain cases of G.P.I. by this route. Naturally enough, he has to admit the essentially "unspecific" nature of this treatment, and here, as will be seen at once, lies the crux of the whole matter. In the face of pathological conditions so desperately intractable, according to common experience, as dementia paralytica we should welcome any efforts, however empirical, however speculative, to inhibit its progression, and we believe, with Prof. FISCHER, in the unwisdom of discarding anything merely because of its not fitting in with existing systems of therapy. The neurologist is aware, for example, how frequently epileptic phenomena are abated, or actually disappear, in the course of exanthems such as measles or chicken-pox, yet as far as we know inoculation of chronic epileptics with exanthematous material has never been seriously proposed. Who shall say there is here no suggestive therapeutic path to be explored? If the clinician is averse to "curing" one disease by the development of another he ought not at the same time to minimise the significance of the clinical facts, however little he is for the moment able to put them to practical use. Similarly with the problem of general paralysis; the deliberate production of leucocytosis is not only scientific, and can be paralleled by various techniques in other therapeutic fields, but it should be submitted to long and fair trial. It would, however, still leave unsettled the question whether for the specific germ of syphilis specific treatment is not the ideal. Those with considerable experience can justifiably claim for specific methods most encouraging results in tabes dorsalis, in early cases at least, and Prof. FISCHER can say no more for leucocytic procedures. In general paralysis, further, recent workers have been obtaining favourable modifications by intracisternal technique with salvarsanised serum, and we see no reason to doubt that with further advances in treatment by mercurial and arsenical compounds still better results will be secured.

We should as a profession be glad to appreciate the real significance of all the above facts, standing as they do for a serious, patient, and imaginative study of the problem of so-called parasyphilis. We should acclaim any evidence which seems to demonstrate ability to modify the all-too-invariable downward course of a common disease, the cause of which is absolutely established, and only the treatment of which is, metaphorically speaking, hanging fire.

High Altitudes and Want of Oxygen.

FOR centuries the increasing feats of mountaineering have been followed with vivid interest by the medical profession, and the past few months have witnessed the latest and greatest accomplishment. The Mount Everest expedition has stimulated the imagination both by the boldness and perseverance of its conception and execution and by the magnificent evidence it affords of the power of the human organism to vary its physiological functions to meet abnormal conditions to which it may be subjected. In all ascents of great altitudes atmospheric conditions have to be reckoned with, as it is just in so far as the reduced barometric pressure influences the respiratory function in its broadest sense that the danger and difficulty lie. PAUL BERT was the first definitely to point out that the percentage composition of the atmosphere varies but little at different altitudes. He showed that it was not the composition of the atmosphere which was of importance but the partial pressures of the gases, particularly of oxygen, which determined the efficiency of respiration. The air at sea-level contains 20·93 per cent. of oxygen, 0·03 per cent. carbon dioxide, and 79·04 per cent. of nitrogen and other indifferent gases. At a barometric pressure of 760 mm. of mercury (allowing for aqueous vapour tension of 47 mm. at 37°C.) the partial pressure of oxygen of the inspired air would be 149 mm. of mercury. But the oxygen partial pressure of the alveolar air is the governing factor in so far as the respiratory function of the lungs is concerned, and this is approximately 100 mm. Hg at sea-level. If for any reason the percentage of oxygen were reduced and the barometric pressure remained at 760 mm., so the oxygen partial pressure would be reduced. If the oxygen in the mixed alveolar air were 6 per cent., then the partial pressure would be approximately 43 mm. Hg ($\frac{760 - 47}{1} \times \frac{6{\cdot}0}{100} = 43$). Sudden subjection of the human organism to an atmospheric environment producing such an alveolar air would rapidly induce unconsciousness and probably death. The reduction of the barometric pressure equivalent to an altitude of 27,000 ft. would similarly reduce the partial pressure of oxygen of the alveolar air to about 43 mm. Hg ($\frac{357 - 47}{1} \times \frac{14{\cdot}0}{100} = 43$). Sudden subjection to such an environment would produce very disastrous results, as has been frequently witnessed in high altitude aeroplane flights during the past few years. On the other hand, flights of great height, even greater than that of the summit of Mount Everest, have been accomplished without untoward effects by the use of oxygen. By varying the conditions of the inspired air the partial pressure of oxygen in the alveoli, and thus the oxygen saturation of the hæmoglobin, may be raised to almost a normal level, and that either by increasing the percentage of oxygen or by raising the barometric pressure. Mice have been kept alive submerged in water provided the water were charged with oxygen at a sufficient pressure.

In the case of an expedition such as that to Mount Everest other factors come into operation. It was amply demonstrated on Pike's Peak and lately by the Royal Society's physiological expedition to the Andes that the animal organism, if given sufficient time, may adapt itself by various physiological changes to the new environment. Many observations have been made on the disastrous results which ensue when too sudden ascents are made. As in all physiological adaptations, time must be given for the organism to accommodate itself to the new environment. It takes not only time but a certain constant and gradual stimulation to bring about a complete marshalling of the forces which are necessary to meet the new conditions. Furthermore, it is important to bear in mind not only the needs of the organism when at rest under such circumstances but also under conditions of increased metabolism. As the metabolism increases, so the demand for oxygen increases. The increase of metabolism may not only result from increased work, but also from increased tissue consumption due to infectious and other processes indicated by fever, which is itself evidence of increased metabolic activity. Oxygen supply must meet the oxygen demand. When there is deficiency of supply and increase of demand the outlook is serious. This apparently was the disaster which overtook a member of the Mount Everest expedition in 1921. It is a well-known experience of all communities at high altitudes that acute febrile disturbances are best treated by removal to sea-level. This applies particularly to those diseases which interfere with the proper respiratory function. Should this change of altitude be impracticable, then the addition of oxygen to the inspired air is indicated in order to supply the greater demand for oxygen by the organism as a whole. In acute febrile pulmonary disease, even at sea-level there is a similar indication for increasing the supply of oxygen in the inspired air, particularly if the

pulmonary lesion interferes with the supply of oxygen to the arterial blood. The insidious effect of acute want of oxygen is seldom appreciated by the victim, and is therefore apt to be overlooked by those in attendance, but the importance of preventing cyanosis and other indications of oxygen-want in acute illnesses rests on the fact that the condition, although insidious, may suddenly reach a disastrous climax.

A good example of acute oxygen-want is seen in those who take high altitude flights in aeroplanes without proper means of increasing the oxygen supply. The onset of unconsciousness may be very sudden and the subject quite oblivious to the danger of his position. In the more gradual ascent of mountaineering, the organism is given an opportunity of accommodating itself. The Andean expedition demonstrated that in spite of an actual deficiency in the oxygen saturation of the arterial blood, certain compensating mechanisms might render the organism capable of accomplishing considerable feats of physical labour without untoward symptoms. Compensation, however, has its limits, so that it may be necessary, for additional work to be accomplished, to increase the partial pressure of oxygen in the inspired air. As this cannot be done by change of pressure it must be done by increasing the oxygen percentage. Certain members of the recent Everest expedition took advantage of these facts and carried with them means of increasing the oxygen percentage. It appears from accounts so far available that their task was accomplished with greater ease. The comparison between the efficiency of those who had oxygen and those who had not will be of great scientific importance when the report of the expedition is made available.

THE PRINCE OF BEGGARS.[1]

THIS is the title of an intimate record of the adventures of Viscount KNUTSFORD in begging for the London Hospital. It tells the story of systematic and shameless mendicancy extending over 25 years of office as chairman of the charity, and the author is Lord KNUTSFORD'S private secretary, Mr. NEVILLE LANGTON, who has allowed himself to be frank to the point of well-mannered indiscretion. He was unable to obtain permission to publish Lord KNUTSFORD'S portrait in front of the book, but he gets over this difficulty in the simplest manner by telling two episodes in which Lord KNUTSFORD was mistaken respectively for Mr. ARTHUR ROBERTS and Lord ROSEBERY—we may endorse the episodes by saying that some time ago, a good many years, the errors were possible. Many of the humorous stories with which the book is packed have already been widely quoted in the daily papers, and some of them were current in medical circles before Mr. LANGTON'S collection was published, but we do not wish to confine this brief review to a grateful recognition of a humorous book. We see in it, also, a record of sustained, serious, and high effort. To make a million by begging is in any circumstances a remarkable feat, but Lord KNUTSFORD'S success was due in only a secondary degree to his love of fun, his prompt use of opportunity, and his wit in letter-writing. The grand object of his work and the transparent sincerity of his devotion to it were the things which made his methods fruitful.

[1] The Prince of Beggars. By Neville Langton. London: Hutchinson and Co., Paternoster-row. Pp. 224. 6s. net.

MEASLES EPIDEMIC IN MANCHESTER.—For the week ending August 26th 449 fresh cases of measles (with 12 deaths) were reported, as against 31 in the corresponding week last year.

END OF SMALL-POX EPIDEMIC IN COLNE VALLEY. The last small-pox patient has been discharged from the isolation hospital at Moor Top, Meltam so that it is concluded that the small-pox epidemic which began in the Colne Valley on Oct. 20th last year has come to an end. At Moor Top hospital about 140 patients were treated, and 18 at the hospital in Huddersfield.

Annotations.

"Ne quid nimis."

CERTIFYING FACTORY SURGEONS.

THE post of certifying factory surgeon, which received statutory recognition 80 years ago, is the oldest in the field of preventive medicine. The work done by the 2300 doctors who hold these appointments, distributed all over the kingdom, although criticism is levelled at it from time to time, is of substantial value. Attention is drawn to this work in the annual report for 1921 of the Association of Certifying Factory Surgeons,[1] and particularly to the importance, when minor defects are found, of being permitted to attach conditions to certificates of fitness for employment. The Association desire the Home Office to publish information as to the extent to which certifying surgeons avail themselves of this permission, and, in order to facilitate collection of data, have prepared convenient record forms for use.

That part of the report which deals with the future of the certifying surgeon is perhaps the most interesting. Here national economy is recognised to be a stumbling-block in the way of official action; on the other hand, welfare work, especially in relation to the provision of first-aid and ambulance equipment, is extending without recognised medical supervision; and an appalling amount of industrial sickness and mortality, due to unhygienic conditions of occupation, continues unchecked with no effort at establishing the faults or devising remedies—work which the certifying surgeon on a properly thought-out plan of action could perform admirably. The ordinary course of evolution should be for the certifying surgeons to be given more work by employers until they develop into industrial surgeons of the type which has so usefully come into existence in America. In that country, however, medical supervision is mainly provided by large industrial concerns; in this country by correct use of the certifying surgeon the small factory and workshop can be catered for. The larger concerns in their own interests are bound sooner or later to establish their medical departments as the economic value of industrial hygiene dawns upon the entrepreneur. To-day this country holds a curiously anomalous position. Owing to the work set on foot by the Ministry of Munitions in war-time, and now continued by the Industrial Fatigue Research Board, we stand far ahead of other countries in our available knowledge and scientific research, but meanwhile there is lack of appreciation of the economic value of this knowledge and of efforts to give it practical application. There is grave danger lest we stand by and leave others to benefit from our own discoveries, even though in the certifying factory surgeons we possess ready made for use a working oragnisation through which action can advantageously be taken.

Given official support and encouragement, the certifying surgeons can themselves do much to save the situation, and they are urged so to help themselves. The report under notice in this respect gives a lead, and is more farseeing than any of its forerunners.

THE ASSOCIATION OF A SPINAL DISEASE WITH HUNGER OSTEOMALACIA.

Dr. Richard Hoffmann,[1] from the medical clinic directed by Prof. Pal in Vienna, describes in detail a condition which occurred frequently during the period of famine in Vienna. Twenty-three cases (14 women, 9 men) were seen between September, 1920, and April, 1921. The disease occurred chiefly in persons of middle age, and gave the following

[1] Report of the Council of the Association of Certifying Factory Surgeons for the Year 1921. Coöperative Printing Society, Manchester. 1922.

[1] Wiener Archiv für Innere Medizin.

symptoms: severe burning pain in the back, usually in the soft parts on either side of the spine, but occasionally in the lower spine itself. The pain shot down into the hip-joint, or down the back of the leg into the calf, simulating sciatica. It was brought on by bending or stooping, getting up or sitting down, and was more severe the longer the body had been at rest. In some cases the pain was so severe that it was started by the least movement, and was agonising on coughing or laughing. The onset was usually gradual, with a sudden acute exacerbation attributed by the patient to a "chill" or to some trauma, and by some to under-feeding. Examination showed the spine in the dorso-lumbar region markedly kyphotic and scoliotic, with the convexity towards the most affected side. The musculature on the affected side was so strongly contracted that it stood out prominently, and was not infrequently mistaken by the patient and also by the doctor for a tumour. The normal lordosis of the spine was either diminished or abolished. On the patient lying down on a soft mattress the contracted muscles relaxed and the scoliosis straightened out. Exquisite tenderness was evinced on pressure over the affected region of the spine, and pain after any jar was experienced, usually maximal between the fourth and fifth lumbar spines and over the lumbo-sacral joint. An almost pathognomonic sign was a tender spot about two finger-breadths below the posterior superior iliac spine along a line joining that point to the tip of the great trochanter. All active movements, especially bending backwards, were painful and limited. Forward bending was done entirely from the hip-joint, and only at the end of the movement did the spine participate to a slight degree. To get up or to lie down the patients turned into the prone position, and supported the weight of the body with their hands on their thighs. The gait was stiff and careful, and in advanced stages the upright position was impossible, and the patient was confined to bed, an absolute prisoner, dreading every movement. Spinal nerve-root disturbances were common, with increase in the tendon reflexes and tremors. Flexion of the thigh during extension of the knee was painful when the flexion was maximal. The vaso-motor system was unstable, hyperidrosis was marked, and muscular irritability was increased. Psychically the patients suffered from irritability, fatigue, and depression. The blood count showed leucopenia of slight degree with a large increase in the mononuclear cells, lymphocytes up to 50 per cent., and large mononuclears up to 19 per cent. From the X-ray picture the cases could be divided into four groups: (1) resembling spondylitis deformans, spondylarthritis chronica, and syndesmitis ossificans; (2) resembling spinal osteomalacia; (3) a combination of slight spondylitis deformans with halisteresis; (4) no definite pathological changes. In the first group there was more or less marked deformity of the vertebræ, with a varying amount of marginal thickening and development of exostoses, and fine local bridge formation, and in one case a layer of calcification spread out over the vertebra, showing as a sharp-edged shadow. The second group resembled cases described by Recklinghausen with "sinking inwards of the middle point of the surface of the body of the vertebra from the sixth dorsal to the fifth lumbar, while the lowest lumbar bodies are bi-concave as a result of the sinking in of the upper and lower margins, and remind one of the form of a fish's vertebra." Dr. Hoffmann expresses the opinion that the scoliosis and kyphosis are the result of an effort on the part of the musculature to prevent the softened bodies from collapsing together, that the root symptoms are due to pressure from osteophytic outgrowths, rather than to narrowing of the spinal foramina by collapse of the vertebræ, that the tender spot in the gluteal region is due to direct pressure on diseased bone, rather than to pressure on a branch of a sacral nerve, and that the pain on extreme flexion of the hip-joint is due to the participation of the lower lumbar spine in the movement, rather than stretching of the sciatic nerve. The differential diagnosis lies between sciatica, lumbago, tuberculous spine, neoplasm, syphilitic meningo-myelitis, perinephritis, and, in women, pelvic disease. As a result of his investigations Dr. Hoffmann comes to the conclusion that his patients were suffering from a disease of the spine, the basis of which was hunger osteomalacia, but which passed during its rapid course through all the stages from a pure osteomalacia to a chronic deforming osteo-arthritis (spondylitis deformans, spondylarthritis chronica ankylopoetica, syndesmitis ossificans), which stage was reached by an effort on the part of the organism to repair the damage done by the osteomalacia, and might be considered as a process of healing. Treatment consists in that advised for osteomalacia, including cod-liver oil and calcium preparations, and rapid results have been obtained after 5 to 10 injections of 1 c.cm. adrenalin 1 in 1000. Reichel[2] has pointed out that Perthes's disease (osteochondritis deformans juvenilis) occurred very frequently during the hunger period, and Dr. Hoffmann agrees with him that this disease is only another form of hunger osteomalacia. In this connexion recent investigations by Axhausen on the ætiology of loose bodies in the knee-joint, on which we commented in THE LANCET of August 19th (p. 403), are of interest, as Axhausen suggests that Perthes's disease is a result of an embolic blocking of vessels supplying the part. It is evident that further investigations are needed to bring these varying theories into line, and to coördinate the work done on the subject.

THE BOARDING-OUT OF LUNATICS IN SCOTLAND.

FROM the recently issued eighth annual report of the General Board of Control for Scotland we learn that 79 private and 1915 pauper lunatics were provided for in private dwellings on Jan. 1st, 1922. Of the private patients, 32 were persons whose means had been placed under curatory by the Court of Session or by a Sheriff Court. Twenty-seven of the whole number were in houses having special licences (23 houses in Scotland possess such licences), and the remaining 52 were placed singly in houses which, having one patient only, required no licence. With regard to the pauper lunatics, in no country except Scotland is every lunatic maintained from public sources under the direct supervision of the central authority. Of the total number of 1915 pauper patients in private dwellings, 12 were certified sane during the year, 18 were removed from the poor-roll by friends, 117 were removed to asylums, and 72 died (the death-rate being 38 per 1000). The usual visits were carried out by officers of the Board, many patients being visited twice during the year. Dr. H. Ferguson Watson is quoted as reporting the general care of the patients as good—supervision, food, clothing, and housing being usually satisfactory. When improvements were recommended they were rapidly undertaken. The arrangements made in Inverness-shire were considered the best; those found in the counties of Ayr, Perth, and Stirling were also rated especially high. The advantages of country boarding are attested by the low death-rate of 2·6 per cent. for patients visited. The average age at death, also, was 67·45 years, and of the 23 deaths 11 were due to senile decay. In no case was any recommendation made for removal of a patient on account of attempts to give the latter too much work to do. One male and two females were discharged recovered. The great bulk of the boarded-out are not recoverable cases, although they stand to benefit by the change from institutional life. It is more economical to board patients out than to retain them in mental institutions. Since unemployment became more prevalent an increasing number of guardians have requested to have the care of patients, and the Board look to superintendents of institutions and inspectors of poor to coöperate in filling the vacancies. The best means for dealing with the accumulating number of defectives, however, is a

[2] Münchener med. Woch., No. 39, 1921.

difficult problem. The maximum number is put under guardianship, but many respectable working-class people have been driven by the trade depression to seek relief in respect of a defective child, who would otherwise not have sought help. A proportion of defectives are unsuited for boarding-out—being easily led into crime, inebriety, prostitution, &c.—but these should be given a trial, for under proper guardianship good habits may be acquired in youth. The higher-grade defective appreciates freedom, but guardians must be carefully selected, especially with regard to the sexual risk in the case of young females. In relation to the selection of guardians, Dr. Gibson reports that he has formed a very favourable idea of the sense of responsibility of, and care exercised by, the average guardian, and urges that something be done to prevent the gradual decrease now apparent in the numbers of those willing to preserve the successful Scottish method of dealing with the insane poor.

THE CERCARIAL FAUNA OF INDIA.

THE elucidation of the life-histories of the digenetic trematodes, since the discovery of the life-cycle of *Fasciola hepatica* by Thomas in 1881, has always exercised a fascination for medical zoologists; and the most recent contribution is in the form of an illustrated supplementary issue of the *Indian Journal of Medical Research*, entirely occupied by an article by Major R. B. Seymour Sewell, I.M.S., entitled "Cercariæ Indicæ." The works of Sonsino and Looss (1896) were directed primarily to the elucidation of the life-cycle in Egypt of *Schistosoma hæmatobium*, the most noxious of all trematodes affecting man; during their researches they discovered and described numerous cercariæ or larval trematodes in the fresh-water molluscs they dissected; but, failing to trace them to their mature or parental forms, they were led to allocate them generic rank, to which descriptive specific names were attached. Lühe (1909), in the course of similar researches on the cercariæ of fresh-water snails in Germany, drew up a provisional classification of these cercariæ on a morphological basis. The next important advance was the determination in 1914 of the cercarial stage of *Schistosoma japonicum* by Miyairi, Suzuki, and Ogata, a discovery which was almost immediately confirmed and expanded by Leiper and Atkinson and finally completed by the former during his studies in Egypt, whereby the existence of two species of schistosomes infesting man in that country was established, and the life-histories traced through two different species of intermediary molluscan hosts and back to the definitive host again. The mainspring of this work was the differentiation and recognition of the furcocercous or fork-tailed cercariæ as the larval stages of the *Schistosomidæ* from among the multitudinous cercariæ inhabiting fresh-water molluscs. These researches imparted a fresh stimulus to the whole subject, and led to the work of Cawston in South Africa and the careful and intricate morphological studies of Faust on the cercariæ of that country, as well as those of North America, a subject upon which Cort has also considerably expanded our knowledge.

The dangers arising from the possible introduction of schistosomiasis into India from troops returning to that country who had become infected during their term of service in Egypt led to the study of this subject being undertaken by Kemp and Gravely, of the zoological survey of India. They found there, as had the several workers already mentioned in their respective areas, that they had entered upon a vast and hitherto unexplored field of zoological research, in which new forms of cercariæ were continually presenting themselves. This subject has now been taken up by Major Sewell, the writer of the absorbing article under notice. One of his first discoveries was that of a fork-tailed cercaria in *Indoplanorbis exustus* and *Limnæa acuminata* corresponding exactly to the description given by Cort for *Schistosoma japonicum*, though the mature form of this parasite is not known to occur in India. Still further researches have led to the production of this important work, in which are described and figured 57 cercariæ of the fresh-water snail fauna of India, wherein a definite system of classification is based upon their outstanding morphological features, but no attempt has been made to allocate generic or specific rank to hitherto undescribed forms. On the other hand, this worker relies for his identification upon their tabulation with definite numerals, being rightly adverse to the bestowal of specific names upon larval forms. Such a study is beset with many difficulties, by no means the least being the uncertainty whether all cercariæ can be separated upon an anatomical basis. Though the vast majority of known cercariæ can be assigned to groups or subgroups, we have no direct evidence that these groups necessarily correspond to various genera or subgenera of the scheme of classification adopted for the adult trematodes. The majority of the fresh-water gastropods of India were found to harbour various cercariæ, and the species found most frequently infected and apparently capable of acting as primary host to a large number of trematode species are *Melanoides tuberculatus* with 17 forms, and *Indoplanorbis exustus* with 15. The number in which the complete life-history is worked out is extremely small, and consequently the known adult forms are few. This is hardly to be wondered at considering the intricacy of the problem.

The possible definitive hosts in any particular case may be birds, reptiles, mammals, batrachians, or fish, all of which are parasitised by trematodes. Many of these hosts are migratory, and may be infected during a short sojourn in India, so that it may be confidently predicted that many years will elapse before this subject is finally elucidated. As it is, helminthologists will be led to concentrate more upon life-histories than upon morphological features of the adult forms. This is a field which as yet has hardly been touched. Surveys of the cercarial fauna on the same lines as set forth in this monograph should be undertaken in all parts of the world, and their results compared. The immensity of the field may be gauged when one realises that Major Sewell has as yet derived his material from a comparatively small part of India. A critical survey of this important work will rest with the systematic zoologist, but of the permanent value of such a contribution to medical zoology there can be no doubt.

THE FUTURE OF THE TUBERCULOSIS COLONY.

Two reports have just appeared synchronously, and as they represent different and, in some respects, opposite views, they give each other perspective and together form a useful contribution to the vexed problem of the tuberculosis colony. The first report[1] deals with the Papworth Hall Colony, which has recently enlarged its sphere of activities by the addition of 28 new cottages designed for patients and their families. When they are completed the total number of houses for ex-patients will be 50. The average number of patients in residence during the year under review was 168, reaching 175 in December. In 1921, 273 patients were admitted, and it will thus be seen that the number of patients who yearly leave the institution for some reason or other is considerable. This does not, however, necessarily reflect on the management of the colony, for there must be many undesirables of the tip-and-run stamp and others to whom the colony idea is distasteful, or for whom the sponsors of the colony have no taste. The majority of the patients were sanatorium failures, and some now earning their living in the colony had been drifting from one institution to another for years. With one or two possible exceptions, no early cases were admitted in 1921, the overwhelming majority being represented by patients with advanced disease. The report

[1] The Cambridgeshire Tuberculosis Colony. Report of the Executive Committee for 1921. Printed by Papworth Industries. Pp. 34

proceeds: "The fathers of families are all earning their wage in Papworth Industries, unassisted by any local authority, although ex-Service men receive a pension varying from 50 per cent. upwards, according to their physical condition." The Papworth Industries employ consumptives as clerks and accountants, mechanics, painters, glaziers, sign-writers, decorators, ticket and show-card writers, printers, carpenters and joiners, brick-layers and plasterers, cabinet-makers and packers, trunk and portmanteau makers, makers of leather goods, boot repairers and surgical boot-makers, tailors, jewellery makers, watch repairers, gardeners, and pig- and poultry-keepers. Dr. P. C. Varrier-Jones, the medical director of the colony and author of the report, concludes: "(1) That all the progress made during the year has pointed to the soundness of the settlement idea; (2) that as the economic stress and strain of the outside world has increased, in such measure have the inhabitants of the settlement been relieved of this pressure; (3) that the bed-rock of the tuberculosis problem being economic, the success of the industrial colony system has been proved. The demand for accommodation far exceeds the supply, and strenuous efforts must be made in the future to increase the size of the village settlement."

The second report[2] consists of an analysis of the material from which tuberculosis colonies are likely to be recruited. In an introductory note Dr. A. K. Chalmers, medical officer of health for Glasgow, raises the question whether ". . . in place of colony schemes, for which so many are temperamentally unsuited, much of the expenditure thereon, and in preparation therefor, would not be productive of more substantial and permanently preventive results were it devoted to improving the conditions affecting health which apply to the population as a whole." The subjects of this inquiry were 785 ex-Service men in Glasgow, of whom 15 per cent. were eliminated as not suffering from tuberculosis. Of the remainder, 35 per cent. were regarded as medically unsuitable, and 29 per cent. as socially unsuitable for a colony scheme. In this last group, represented by 191 patients, there were as many as 104 in whom alcoholism was one of the reasons for disqualification. With regard to the remaining 34 per cent., represented by 242 patients, only 127 were considered as physically and temperamentally fit for a colony. The authors of this report come to the conclusion that "scope for the successful application of retraining schemes is confined within narrow limits." With regard to the 127 men considered suitable after a severe process of elimination the authors remark that "among these, however, are a number who are quite fit for their original occupation, and others who are at present suitably enough employed." They conclude: "The principal justification, therefore, for dealing with the tuberculosis problem, partly on village settlement lines, would be the public health value of the project. Would the preventive results be commensurate with the cost? . . . . A scheme large enough to absorb the majority of cases as they arise from year to year would reach considerable dimensions, ... it is difficult to see where a radical policy of this kind might end. . . . The problem would increase in snowball fashion. . . . The best that can be said in favour of a scheme of this kind is that it would be admirable for those included in it, and the worst that it would leave many of the problems of tuberculosis still untouched, principally because it is only a partial solution of one aspect of the problem. . . . The village settlement as a method of treating the individual case is admirable; as a public health investment it might not justify its cost."

It will be noted that the authors of the Glasgow report assume that a considerable degree of physical fitness is required of would-be colonists. The author of the Papworth report, on the other hand, insists that success has been achieved, not with early but with severe cases. According to the Papworth standard, therefore, many of the patients rejected as unsuitable in the Glasgow material would make good in a colony scheme. The authors of both reports would probably be more in agreement as to social disqualifications, and with regard to the victims of alcoholism, it would be unfair to the tender reputation of the village settlement if it were to be employed at once as a home for consumptives and a reformatory for drunkards. Finance is a sore subject at Papworth, and while the colony idea is still on probation, its advocates would do well to concentrate rather on quality than quantity, and to prove beyond doubt the value of the model before they attempt wholesale extensions.

[2] Corporation of Glasgow. Report on an Enquiry into the Various Types of Tuberculous Patients, with Reference to their Training and Re-employment. By Dr. A. S. M. Macgregor and Dr. J. A. Wilson. With an Introductory Note by the Medical Officer of Health, Glasgow. Pp. 14.

VENTILATION OF DEBATING CHAMBERS.

THE ventilation of places of public assembly will remain a problem so long as individual members of the public have different ideas of what ventilation means. The atmosphere of the Houses of Parliament has been a subject of debate among its members for 70 years or so. Since 1893 the complaint has frequently been made that members of the Lower House suffer from lassitude not necessarily the result of legislative activities, and although several investigations have demonstrated that little exception can be taken to the quality of the air supplied, the air has still been found by many to be lacking in freshness. The difficulty is a real one of providing an atmosphere uncongenial to pathogenic organisms and still adapted to human comfort. The air currents suggested by Dr. Leonard Hill were recently made the subject of experimental trial on a model House of Commons at the National Physical Laboratory. In the meantime a new system has been introduced into the beautifully appointed debating chamber of the London County Council. The main duct through which fresh air enters is subdivided in the chamber and debouches in the form of funnel-shaped delivery tubes fixed in front of the desk of each sitting member who, by a mechanical contrivance, can close or open the funnel to admit or shut off the air. This arrangement appears to give the individual liberty in regard to air movement suited to the personal taste of the members. There seems, however, occasion for a note of caution, for an arrangement which is used to deliver fresh air once a week during the period the Council is sitting, may accumulate dust during the intervals. Doubtless proper care in the arrangements will prevent what appears to be a very practical and hygienic device from becoming a means of diffusion of accumulated dust.

POTASSIUM PERMANGANATE IN DERMATOLOGY.

Dr. Samuel Feldman and Dr. Benjamin F. Ochs[1] during the last four years have treated a large number of patients in various dispensaries in New York City suffering from epidermophytosis or eczematoid ringworm with potassium permanganate dressings, a method first employed by the late Dr. W. S. Gottheil, a well-known dermatologist of New York. The usual strength of the solution employed was 1 : 1000, but in patients with much irritation the concentration was reduced to 1 : 2000 or even as low as 1 : 5000. A pledget of cotton-wool soaked in the solution was inserted between the fingers or toes once every 24 hours and in a week's time the lesions were usually cured. Owing to the liability to recurrence it is advisable to continue the treatment for a long time after the lesions have disappeared. In cases of eczematoid ringworm and long-standing eczema marginatum with infiltration and lichenification, a saturated solution of the drug in the form of daily paintings was employed. In the early stages of epidermophyton infection, where the deep-seated vesicle is unbroken and covered with a thick layer of horny epidermis, a wet dressing of a 1 per cent.

[1] Archives of Dermatology and Syphilology, August, 1922.

aqueous solution of salicylic acid, which can readily be made up by the addition of about four times its weight of borax, is first applied until maceration occurs, when the lesions become accessible to the potassium permanganate solution. From their experience of this method the writers have come to the conclusion that potassium permanganate is a more powerful remedial agent than any they have hitherto employed. Owing to the fact that it exerts a beneficial action on some definitely non-fungoid cases, such as chronic eczema and seborrhœic dermatitis, its success is probably due to changes produced in the cells of the epidermis rather than to the direct action of the drug on the fungus.

CARL THIERSCH.

THE present generation of English surgeons associates the name of Thiersch with skin grafting and little else, but he was a man of many parts, and the story of his life, recently published by his son, Justus Thiersch,[1] shows him to have been a scientist in the most exacting sense of the word. He studied in Munich, Berlin, Vienna, and Paris, and as well as being an anatomist and surgeon, he was something of a bacteriologist, and in 1878 he was investigating hypnotism and allied subjects in a spirit which showed him to be a generation ahead of his time. His son's account of him as an examiner in surgery depicts him as a man unable to suffer fools gladly. He had no great faith in, or love for, examinations, considering them unnecessary for the well-taught student, and a barrier under which the ignorant student can often creep, though he is unqualified to jump it. Thiersch was particularly contemptuous of the examination in surgical instruments, but he had to conform to conventions. One of his examinees could not put a name to a single instrument until Thiersch thrust a pair of scissors under his nose and asked him to put a name to them. This the examinee did with great aplomb, and in the course of congratulating the examinees on passing this test, Thiersch added: "All have passed, even the Scissor Man." On Sunday evenings he used to give a demonstration on cases of skin and venereal disease which was largely attended by students of other subjects than medicine. On one occasion he addressed his audience thus: "I cannot to-day show you a case of venereal disease as not one has entered the hospital this week, so the representatives of law and theology may go." Thiersch was singularly honest, and when a patient, supposed to be dying of cancer, was found post mortem to have suffered from nothing worse than hæmorrhoids, Thiersch, instead of hushing the matter up, used this case as a text for a public address. His biography includes a list of his many publications, and a family tree which is remarkable for the number of distinguished names: the family of Thiersch was evidently one in which intellectual qualities were distributed with more than ordinary profusion.

THE PREVALENCE OF NOTIFIABLE DISEASES.

COMPARATIVE statistics of the number of cases of notifiable infectious diseases possess great epidemiological value, this value increasing rapidly with the serial number of years of records; and we have on several occasions drawn attention to the value of the annual returns of incidence of notifiable infectious diseases in each sanitary district in England and Wales issued by the Ministry of Health, which has now appeared during 12 consecutive years, in exactly the same form, thus rendering local and national comparisons easy to make. The weekly issue of public health reports for July 22nd, 1922, which is prepared by the United States Public Health Service, contains a similar return for 1921 for all cities with a population between 10,000 and 100,000. It is more complete than the British return, as it includes not only influenza, but also measles—which is now only notifiable in a minority of districts in this country—and all forms of pneumonia, instead of influenzal pneumonia only. The returns are given for each disease separately, and comprise both case-rates and death-rates and case-mortality or fatality-rates. For comparative purposes the median rate for previous years for the same disease is given, instead of an average rate. The median is obtained by arranging the rates for previous years in their order of magnitude; the middle item in the array is the median. No summary of the returns is given, but we note that in Danbury in Connecticut 9·24 cases of influenza per 1000 inhabitants were recorded, the amount in most other areas being insignificant. In Riverside, California, 46 cases of measles occurred per 1000 inhabitants, in Wilmington, N.C., 44, and in most areas relatively few cases were reported. Pneumonia was reported to the extent of 8 and 6 cases per 1000 inhabitants in two districts, more commonly 1 case or less per 1000. The reporting of cases of tuberculosis (all forms) varied greatly, in some areas more than 4 and in some less than 1 per 1000 inhabitants. There was a corresponding discrepancy in the proportion between cases and deaths. The possible errors of inferences from these rates are pointed out. Thus a high fatality-rate of a disease may mean an unusually virulent type of disease, or that the physicians did not report all their cases, or a low standard of treatment. Notwithstanding these possibilities of error the tabulation of local sickness statistics is of great value in ensuring comparisons between one area and another and in helping to raise the standard of reporting of cases and the public health action following on this. The ultimate epidemiological possibilities of utility are also great.

THE FOOD POISONING AT LOCH MAREE.

AT the inquiry which opened at Dingwall on Sept. 5th into the eight deaths which occurred at Loch Maree, it was stated that the poisoning was confined to those who had partaken of one or more pots of a particular brand of meat paste. Prof. T. K. Monro expressed no doubt that the deaths were due to botulism, and the other medical witnesses who were examined agreed that the symptoms from the first pointed to this poison. The tenant of the hotel stated that the same brand of potted meat had been used during his whole tenancy of 12 years. Both Prof. Monro and Dr. W. E. Carnegie Dickson, who were staying in the district and who attended the patients in their fatal illness, considered that little help would have resulted from antitoxin if it had been available. Dr. Dickson was of opinion that the damage to nervous tissue was already too advanced. Nevertheless there was agreement that antitoxic serum would have been used had it been available.

Dr. Henry Roy Dean, since 1915 professor of pathology in Manchester University, and recently elected to the new University chair of bacteriology tenable at University College, London, has been appointed professor of pathology at Cambridge University in succession to the late Sir German Sims Woodhead.

WE regret to record the sudden death in Scotland on Sept. 5th of Sir Charles Ryall, senior surgeon to the Bolingbroke Hospital and the Brompton Cancer Hospital, who will be remembered for his distinguished work during the war as a member of the Special Medical Appeal Board and assessor to appeal tribunals.

Dr. Matthew Mitchell Bird, whose death took place at Margate on August 27th, had held the post of medical superintendent at St. Mary's Hospital, London, for over 30 years and was well known to many generations of students there. Some two years ago he was appointed to the medical charge of the Royal Sea Bathing Hospital at Margate.

[1] Carl Thiersch, Sein Leben Dargestellt von Justus Thiersch. 1922. Leipzig: Johann Ambrosius Barth. Pp. 190.

TUBERCULOSIS.

Chemotherapy in Tuberculosis.

Two recent reviews of chemotherapy in tuberculosis by writers, whose names carry weight, leave no doubt as to the failure, at present, of treatment of tuberculosis with chemicals. In the *Revue de la Tuberculose* (No. 3, 1922), a paper by A. Calmette deals with the claims of calcium, silver, bismuth, copper, iodine, arsenic, various dyes, and numerous other drugs in the treatment of tuberculosis. It seems almost inevitable that the optimistic claims made by the advocates of new departures in chemotherapy should be followed by a wave of pessimism, and in this connexion it is well to bear in mind the verdict of Dr. Charles L. Minor, who recently wrote: "I would say that the longer I treat tuberculosis, the more I find that the essence of the treatment is psychological." Doubtless this is the reason why the hopeful pioneers of new methods are so remarkably successful, whereas their unconvinced and critical successors find so little good to say of them. As Calmette's paper shows, almost every drug in the pharmacopœia and out of it has had its day, and though none has survived the post-pioneer stage of reaction, he suggests that some of the earlier experiments deserve repetition, and the drugs to which he leans most favourably are those of the iodine group. But—and this is a point which cannot be overemphasised—it is, in his opinion, essential that research in the chemotherapy of tuberculosis should be based on scientific lines and conducted on experimental animals. In the last edition of their "Lehrbuch der Spezifischen Diagnostik und Therapie der Tuberkulose," Dr. Bandelier and Prof. Roepke devote considerable space to a discussion of the treatment of tuberculosis with copper and gold preparations. With regard to the former, their verdict with reference to pulmonary tuberculosis is emphatically condemnatory; in theory this line of treatment is unconvincing, and in practice it is disappointing. It has also suffered from frantic supporters, one of whom has advocated the crazy scheme of feeding scrofulous infants on "copper milk" as a prophylactic measure. With regard to treatment with gold preparations, notably krysolgan, the authors are less certain in their verdict. It has often been claimed for krysolgan that, while it is of little value in pulmonary tuberculosis, it is frequently beneficial in tuberculosis of the larynx. The authors have given it in more than 50 cases of pulmonary tuberculosis complicated by tuberculosis of the larynx. Improvement in this complication was often seen, but as this treatment was supplemented by injections of tuberculin, the experiment was unconvincing, and the authors themselves express grave doubts as to the connexion between the improvement and the injected gold. This study is a tribute to the wisdom of Calmette's appeal to investigate the action of drugs on tuberculosis in experimental animals and not in such a psychologically complex creature as man.

The Work of the Trudeau Sanatorium.

The thirty-seventh annual medical report for the year ending Oct. 31st, 1921, shows that important research is being carried on with regard to intestinal tuberculosis associated with pulmonary tuberculosis. Approximately 1000 cases of intestinal tuberculosis, suspected or proven, have been studied, 55 positive or negative have been operated on or have come to necropsy, and in as many as 53 the X ray diagnosis has been confirmed. About 50 other cases have been treated by ultra-violet or X rays, and more than half this number have shown definite radiological changes for the better. Three cases of intestinal tuberculosis which came to necropsy after treatment with the quartz-mercury lamp presented inactive lesions. If, by early diagnosis, and the institution of actinotherapy in the first stages of the disease, intestinal tuberculosis can be arrested, the Trudeau Sanatorium will have achieved one more important advance of which it may, indeed, be proud. Another problem in which it has been recently interested is that of the respective merits of rest and exercise. In America, as in Europe, the value of auto-inoculations and focal reactions has lately been accepted with something less of that single-hearted faith shown in this matter more than a decade back. An outcome of this reaction was the organisation at the Trudeau Sanatorium of a "rest-squad," every member of which was kept in bed for six weeks. A comparison of the results obtained in "rest-squad" patients with those who were subjected to the usual sanatorium routine failed to reveal any striking difference, and doubtless this experiment will have to be repeated on a much larger scale before this problem can be solved. Many other lines of research conducted at the Trudeau Sanatorium are discussed, and the report is in itself cogent evidence of the value of a sanatorium as a research centre.

Forcible Hospitalisation of Consumptives in Chicago.

In the *Bulletin* of the City of Chicago Municipal Tuberculosis Sanitarium for April, 1922, there is a paper by Dr. E. P. Troy, in which he gives some instructive statistical information. During the last few years in Chicago an aggressive crusade against the "open" case in contact with children has been carried on, an attempt being made to break up the contact in every case. In a certain number of cases it was found necessary to resort to forcible hospitalisation. In 1920 3050 cases were under supervision and 94 were forcibly hospitalised. The number of "open" cases in contact with children was 235, and in 1921 this number was reduced to 39, "and it is probable that these 39 cases were under investigation and awaiting adjustment." But certain aspects of the tuberculosis problem, the reverse of reassuring, were brought to light by this campaign. In the two years under review, 773 "open" cases left the town and 211 disappeared, a total of 984 "open" cases which escaped the supervision of the medical authorities. The lesson of this experiment seems to be that the most important effect of a campaign against tuberculosis, organised so as to afflict rather than help consumptives, is to drive the disease into subterranean channels and thus reduce appreciably the prospects of early diagnosis and successful treatment. Common sense and an elementary knowledge of psychology are assuredly as necessary to the equipment of organisers of tuberculosis campaigns as familiarity with the subjects required of candidates for the D.P.H.

HEALTH RESORTS ABROAD.

I. ASSOUAN.

A MEDICAL man who has spent the three last winters in Luxor for his own health has supplied us with the following information relating to the value of Upper Egypt as a winter resort. Our correspondent states with regard to political unrest that he has seen nothing of it, with the exception of a couple of demonstrations in the streets of Cairo by students. Last winter there were thousands of Americans all over Egypt, many of them young girls, to whom the only apparent "Egyptian question" was the problem of how much "baksheesh" to give to the donkey boy; our informant's experience leads him to the opinion that life is as safe there, if not safer, than it is in England. In writing of Assouan as a health resort, he quotes a "well-known doctor," who, knowing the winter resorts of America well, informed him that there is not a climate in the United States to compare with Assouan. Assouan is about 600 miles due south of Cairo; it lies on the eastern bank of the Nile, in the desert. There is no rainfall, and the winter is one of perpetual sunshine. The Cataract Hotel is fitted with fireplaces in the bedrooms, but our correspondent spent January and February there and never once required a fire.

The outstanding diseases for which this resort is almost a specific are the arthritic group, nephritis in

its early stage, winter cough, and chronic bronchitis with profuse discharge; benefit is also gained by those requiring a winter to harden up after pulmonary empyema, pleural effusion, &c. No case of *advanced* disease—excepting joint affections—should be sent, because the journey is long and the patient may not have sufficient vigour to adjust himself to the dry climate. The cases of rheumatic joints which benefit are those which are better in summer and worse in winter; patients likely to be exhausted by heat should not be sent. The patient should land in Egypt not later than the third week in November, which month is perfect in Cairo; towards the end of it the rains begin, and then the patient must go to Assouan, staying perhaps a week or two at Luxor, 450 miles south of Cairo. The railway journey (6½ hours from Luxor to Assouan) is dusty, and the best way for an invalid to make this trip is by one of Messrs. Thos. Cook and Son's palatial steamers. By travelling as above the visitor never has a cold day. Should he delay his arrival till late December or January he is often so upset by the cold of the rail and sea journey of lower Egypt that his whole winter is ruined. He should never be tempted to sight-seeing on arrival, but should rest quietly in Cairo, studying the climate, and never without an extra wrap for the fall in temperature at sunset. All sight-seeing should be done at the end of the winter. Although some cases of active pulmonary tuberculosis do exceedingly well in Upper Egypt, our correspondent does not recommend it for this disease, especially if there be a tendency to hæmorrhage.

All inquiries as to terms at the Winter Palace Hotel, Luxor, and the Cataract Hotel, Assouan, should be addressed to Mr. A. R. Badrutt, Palace Hotel, Lucerne, Switzerland. The hotel staffs are Swiss or French, and they do everything in their power for the comfort of their visitors. Messrs. Thos. Cook and Son advise as to routes to Egypt. The water-supply of the above hotels in Luxor and Assouan is first class, and a profusion of fresh fruit and vegetables is grown in the garden of the Winter Palace, which supplies Assouan and Luxor. The thickest clothes as well as light ones should be taken; if not required in Egypt they will certainly be needed on the voyage. Persons sent under doctor's orders who make arrangements for a stay of at least two months at the Cataract Hotel, Assouan, will be taken for an inclusive rate of one pound Egyptian per diem.

II. BAGNOLES-DE-L'ORNE.

The thermal springs of Bagnoles-de-l'Orne appear to have first attracted notice in the reign of Henri IV., and the thermal establishment dates from 1718. The waters gained some renown for their cicatrising property in the campaign of 1870, and during the war of 1914–18 a large number of French officers and men were treated there for varix, varicose ulcers, and after-effects of phlebitis. The spa seems little known in this country, although becoming increasingly popular in France. It is situated in a narrow woody gorge on the borders of Normandy and Brittany, and is readily accessible. Of the two springs, the Grande Source has a constant temperature of 79° F., contains thorium, and emits a gas of a high degree of radio-activity. The Source des Fées is a cold arsenical water of 56°, employed only for drinking, and considered efficacious in the treatment of chlorosis and amenorrhœa. The chemical composition of the waters is hardly sufficient to explain their therapeutic action. French balneological experts, such as Prof. Robin, Prof. Huchard, and Prof. Renon, maintain that the waters have elective action in diseases of the veins; hence the principal conditions treated are those resulting from chronic phlebitis of whatever origin. There are at present 190 bathrooms—a number soon to be increased—a large swimming bath, and the usual equipment of bathing establishments. The water of the Grande Source possesses a distinct and peculiar odour, is oily to the touch, and leaves a styptic aftertaste in the mouth. The pale sea-green discoloration produced with soap is due to the action of alkali on the contained silica. The reconstitutive effect of the water is illustrated by the current legend of an old horse which, overcome by fatigue and abandoned by its master, drank of the waters and immediately became the war-horse of its former days. The medical man who sends us these details recently visited the spot on account of recurrent attacks of phlebitis consequent on fever contracted in Burma 14 years ago. His last attack in March of the present year involved the saphenous, iliac, and femoral veins, with much swelling of the thigh. Thirty days after leaving his bed, under the care of Dr. Quiserne, of Bagnoles, he began treatment with baths, at first daily for 15 minutes at 95°, at the end of a week the duration was increased to 40 minutes, and at the tenth bath the temperature was raised to 97°, and douching, applied to the spine and limbs in erect posture, was begun. At the end of the course of 22 baths he was able to walk with much less pain and discomfort. There is a cheerful atmosphere of optimism about the spa, and the hotel opposite the thermal establishment has the water from the Grande Source laid on so that patients inhale radium emanation night and day during their whole course. Bagnoles is five hours from Paris, and full information regarding a cure will be sent on application to the head office, 78, rue de Provence, Paris. In 1921 4500 patients were treated there. The expense is moderate, and 30 to 35 francs a day will cover the usual period of three weeks' treatment.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

The Vienna Institute for Home Nursing.

THERE exists in Vienna an institute, supported by voluntary contributions, which supplies trained nurses and other assistance free of charge to sick persons who are unable to find accommodation in hospitals. This organisation was founded at a time when it was most difficult to obtain a bed in a hospital and many poor patients were suffering because of lack of trained help. During the influenza epidemic of 1918–19 its services were particularly appreciated. In a recently published report dealing with the year 1921, we read that 104 nurses dealt with 4193 persons; the service rendered included 6963 "all-night" and 11,917, "all-day" attendances, besides nearly 70,000 single visits of from half an hour to four hours to the homes of patients. The institute has 25 stations in Vienna and 50 stations in the country. It affords help not only by sending out nurses, but also by supplying medicines, bandages, and nursing appliances (thermometers, cotton-wool, ice-bags, baby linen, &c.), and also food and drugs where needed. Over 3000 families, comprising nearly 8500 persons, were thus assisted; these were mostly middle-class families; they are frequently very poor but object to being classed as paupers.

Welfare of Crippled Children.

During the past few years the Viennese schools have contained large numbers of crippled children who were prevented by weakness or by periods spent in hospital from continuous attendance. It was therefore decided to collect all such children in a special school established in the orthopædic hospital. Nearly 700 children, including 169 cases of "surgical tuberculosis," came under this arrangement; those above the age of 14 years were taken from school and treated elsewhere. Children unable to sit up are wheeled into the classroom in their beds. These children are being taught occupations suitable to their condition, unless the parents have already decided upon a career for them. This charitable work is supported voluntarily, part of the costs being defrayed from a sum devoted to the purpose by the Swedish and American Red Cross organisations. When a child leaves the cripples' school he or she is noted down for after-care; regular inspection of such cases is carried out at short intervals by trained nurses, and records are kept so that the physical and social

conditions to which the child is subjected are known to the institute, and advice and help is given when required. By these simple means it is possible to make these afflicted children useful members of the community.

Psychic Damage to School-children from Unsuitable Reading.

At a recent meeting of elementary school boards—which bodies are chosen, almost without exception, from amongst the parents of the school-children—bitter complaints were made of the indiscriminate reading matter now offered to children of school age. Medical authorities were quoted to the effect that the demoralisation so often noted in young people is due to the influence of detective stories and narratives of robberies and daring murders upon the imagination of the growing individual. Criminality is rapidly increasing among juveniles; teachers are becoming able to recognise the signs of "infection" by such reading—e.g., bad dreams, less attention to school work, and a condition of excitement. Local authorities are urged to forbid the sale of books dealing with detectives and criminals, and to suppress the showing of kinema films devoted to similar subjects. It was pointed out that merely to forbid a child to read such books, whilst leaving the supply at hand, would only drive him to deceit and untruthfulness.

Deaths in the Medical Profession.

The medical faculty of this city has lately suffered several severe losses, amongst them being that of Prof. Theodor Panzer, for 14 years professor of chemistry at the Vienna Veterinary College, where he exerted a great influence upon his pupils, and found time to publish much important work on the constitution of poisons, albuminous bodies, and animal juices; he was a master of forensic chemistry, and his advice was widely sought. Prof. Florian Kratschmer, whose name was not widely known outside his own country, also died recently at a great age; and Prof. Albrecht, head of the pathological institute, has now died suddenly when barely 50 years of age. He was well known for his patient investigations into the histopathology of cancer and tuberculosis, and for serological studies of internal secretion.

Increase of Goitre Amongst Children.

As the result of a suggestion thrown out by the Chief Officer of Health of Vienna, a systematic examination of school-children, to determine the incidence of enlargement of the thyroid gland, will be carried out during the present year. In this connexion Dr. Schick, of the children's department in one of the chief suburban hospitals, has already examined all children attending the hospital as out-patients. In 1914 only 0·5 per cent. of these children were reported as suffering from visible goitre, and in 1921, when more attention was paid to the condition, over 2 per cent. presented signs of it; but in the first half of 1922, 56 children out of 550 (i.e., over 10 per cent.) had distinct enlargement. There is thus no doubt that we have a real goitre epidemic in Vienna. The reason is not yet definitely known, but many authorities attribute it to the fact that the city water-supply comes from Styria, a country where goitre is common. No case of goitre in children below 7 years old is reported from the hospital; of children affected between the ages of 7 and 14 years, about 40 per cent. are boys. The enlargement is mostly of the parenchymatous, soft type; nodules or cystic conditions are rarely found. As a rule, the middle lobe is enlarged. The treatment given at first consisted of internal administration of minute doses of iodine over prolonged periods, but better and quicker results are now obtained from an iodine ointment containing potassium iodide. Dr. Schick pointed out that in those parts of Switzerland where similar conditions prevail the table salt of commerce is mixed with a minute percentage of potassium iodide (15 mg. per kg. of salt), and thus served out to the population. All cases observed up to the present have been much improved by this conservative treatment, and in no case was surgical interference required.

Public Health Services.

INSURANCE PRACTICE AND LOCK-UP SURGERIES.

FROM the first day of the present month an additional clause was inserted in the insurance doctor's terms of service to run as follows:—

A practitioner shall, when required, satisfy the Committee, or, on appeal, the Minister, that the arrangements for the conduct of his practice, and in particular for the visiting of those of his patients whose condition so requires, are such as to enable the practitioner's obligation under these terms of service to be adequately carried out.

This regulation puts the obligation on the insurance practitioner to be at least in communication with his surgery at all hours. In other words, he must either have a caretaker and telephone on the premises or must arrange for a neighbouring residential doctor to deputise for him. Such arrangements have long been found desirable in private practice and can hardly be considered exacting for medical service under the State. There is a certain feeling of regret among the great majority of panel practitioners that the Minister of Health should have found it necessary to frame such a regulation.

NOTIFICATION OF INFECTIOUS DISEASE BY TEACHERS.

FROM the annual report, which we summarise later, we learn that Dr. J. T. C. Nash, as chief school medical officer to the Norfolk Education Committee, has instituted a scheme of notification of suspected cases by teachers, both the school medical officer and the district medical officer of health being notified. Instructions are issued to teachers, which include the reporting of the absence of several children of one family from school at the same time for illness, even if there is no information as to the nature of the illness. In the spring of 1921 notifications from several schools impelled him to visit various districts and schools in the county, and these visits revealed the presence of an anomalous infective disease, of which the incubation period was almost consistently four days. The initial symptoms were headache, sore throat, nasal catarrh, and slight fever; exceptionally there was a faint rosy rash on the trunk, and rarely vomiting; the tongue was furred and the premastoid glands enlarged, and only one case out of very many showed slight desquamation of the hands. On account of the absence in most cases of rash and vomiting, and the four days' incubation period, Dr. Nash considers that ordinary scarlet fever may be ruled out, but that the infection may have been a variant of scarlet fever of a very mild type, or it may have been a manifestation of protean influenza. A similar outbreak was described some years ago by Dr. R. A. Dunn, medical officer of health to the combined districts of East Herts and Essex. Dr. Nash also describes an anomalous infection occurring among 110 infants at a girls' school, when the symptoms rather suggested diphtheria, several of the cases showing diphtheroid (Hoffmann) bacilli on bacteriological examination of swabs. Dr. Nash states that he is accumulating further clinical and bacteriological evidence to supplement his recorded observations on the evolutionary connexion between scarlet fever and diphtheria, diseases which statistics indicate epidemiologically have often concomitant waves of prevalence. He remarks with justice that such observations as the above are asked for by the Ministry of Health and the Board of Education.

ROYAL INSTITUTE OF PUBLIC HEALTH.—A course of nine weekly lectures on maternity, child welfare, and school hygiene will be delivered in the lecture hall of the Institute, 37, Russell-square, London, W.C. 1, beginning Wednesday, Oct. 18th, at 4 P.M., when Prof. Louise McIlroy will lecture on the Influence of Ante-Natal Care upon Infant Mortality. The subsequent lectures will be announced in our Diary columns. No tickets of admission are required; the course is intended primarily for Fellows, members, and post-graduate students of the Institute, but medical men, students, and all others engaged in public health work or interested in medico-sociological problems are invited.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

A GROUP OF METROPOLITAN BOROUGHS AND URBAN DISTRICTS.

THE subjoined table gives some of the principal health statistics of boroughs and urban districts in or near London, and is followed by comments on the annual health reports for 1921. The figures for the London boroughs are extracted from Dr. W. H. Hamer's report.

District.	Estimated population, 1921.	Birth-rate.	Death-rate.	Infant mortality rate	Diarrhœa and enteritis rates (ages 0–2) per 1000 births.	Phthisis death-rate.	Cancer death-rate.
County of London	4,514,405	22·1	12·5	81·0	21·6	1·07	1·33
Kensington, M. B.	177,300	19·3	13·8	107·0	30·4	0·87	1·62
Hampstead ,,	86,890	15·4	11·2	66·0	11·9	0·74	1·54
Hackney ,,	224,200	22·4	11·5	66·0	20·7	1·01	1·31
Holborn ,,	43,520	14·9	12·8	79·0	12·3	0·97	1·29
Bethnal Green ,,	118,300	25·4	12·9	100·0	38·3	1·33	1·05
Poplar ,,	164,100	27·3	12·8	83·0	21·9	1·05	1·13
Edmonton U.D.	67,800	24·5	10·1	69·6	10·2	0·93	0·97
Finchley ,,	46,680	18·8	11·3	71·6	17·0	0·80	1·16
Hendon ,,	55,500	17·9	7·9	61·0	12·0	0·50	1·0
Tottenham ,,	149,200	22·8	10·4	67·9	17·0	0·79	1·1
Beckenham ,,	33,350	16·1	10·0	63·0	20·4	0·75	1·3
Croydon C. B. ..	191,500	18·9	10·7	74·0	12·0	0·75	1·14

Kensington.—The outstanding feature of Dr. James Fenton's report for 1921 is the high infant mortality rate. The only metropolitan borough with a higher infant mortality rate was Shoreditch, and only two had higher mortality rates for diarrhœa and enteritis under 2 years of age—viz., Shoreditch and Bethnal Green. There is, of course, a great difference between North and South Kensington. The former has a birth-rate of 24·7 and an infant mortality rate of 119, while the latter has a birth-rate of 10·7 and an infant mortality rate of 85. Dr. Fenton, in discussing the explanation, has a great deal to say with regard to the unsatisfactory "tenement houses" and "mews dwellings." The tenement houses which are let to a number of families, without being specially adapted, number 5690, of which 2079 are on the register of houses let in lodgings and subject to by-laws. The mews dwellings number 2091. During 1921 unemployment and short employment were rife. Dr. Fenton sums up the chief factors in this high infant mortality as—the ignorance, the carelessness, and sometimes even the indifference of certain mothers; the poverty in many households; the unsuitable and insufficient feeding and clothing of mothers and children; the crowded homes with domestic dirt, the insufficient food storage accommodation and sanitary arrangements, and the difficulties of home nursing—faults largely inherent to the tenement house system.

Hampstead.—Dr. Frank E. Scrase reports that two additional health visitors have been appointed. The arrangement for providing meals for mothers at public restaurants did not prove a success, and by the end of the year only one mother could be persuaded to accept this form of assistance. Hampstead seems to get a better milk-supply than most districts, as only one out of 320 samples was adulterated. Dr. Mary Kidd reports that the prematernity clinics are doing successful work, thanks to the coöperation of the Jubilee Nurses, who undertake much of the midwifery in the district. The dental clinic is appreciated by the mothers, but Dr. Kidd much regrets the curtailment of the free milk. Dr. Scrase reports that the new pulverising plant for house refuse is a success and that its use is likely to be extended. He also points out the great need for increased sanitary accommodation for visitors to the Heath, which is the subject of negotiation between the county council and the borough council. In Dr. Scrase's opinion there is more overcrowding than has ever been known in Hampstead. Owing to the scarcity of houses the Closing Order cannot be used. The revised tuberculosis dispensary scheme is adequate for the needs of the borough. In reply to the county council complaint of the large expenditure on drugs, malt, and oil, it is pointed out that patients will not attend regularly if they are not supplied with medicine.

Hackney.—Dr. G. H. Dart protests strongly against the curtailment of the milk allowances and states that the greatest suffering was experienced by numbers of poor families in consequence, and that there was noticeable deterioration in the children attending the centres. In his description of the elaborate precautions enjoined by the Ministry to prevent abuse, one is forced to the conclusion that the prevention of abuse is likely to prove more costly than the abuse itself, and that a much simpler system, placing more reliance on the discretion of the local authority, is needed. Dr. Dart lays stress on the scanty provision for advanced cases of tuberculosis. He also points out that it is not a business proposition to repair many of the houses, as they have been allowed to get into such a bad state, and that there is an increasing tendency on the part of owners to induce tenants, even weekly tenants, to sign repairing agreements. The river Lee has been in a most offensive and dangerous condition throughout the summer, and a statement of complaints from 1901 onwards is given in the report, culminating in a conference at the Ministry of Health, when the matter was referred to the engineering advisers of the Ministry and the authorities concerned to devise means for dealing with the sewage at present discharged into the Lee.

Holborn.—Dr. C. W. Hutt reports that one of the most unsatisfactory features of housing in his district is the large number of houses let in lodgings and the splitting up of houses into tenements which are not properly adapted for the use of separate families. The occurrence of a case of diphtheria at a creche revealed the fact that 16 out of 21 children were "carriers." Dr. Hutt complains of the failure to notify cases of ophthalmia neonatorum to the borough medical officer of health, arising out of the fact that the borough council is not the supervising authority of the midwives.

Bethnal Green.—Dr. G. E. Oates hopes that the steadily decreasing cost of material and labour may soon enable a fresh start to be made in clearing away certain notorious slum areas. Of the 295 infant deaths, 99 were due to diarrhœa and enteritis, Bethnal Green having the highest mortality under two among the London boroughs for these diseases during 1921. Dr. Oates points out the difficulties of administration resulting from the frequent change of policy on the part of the Ministry as to the supply of milk for mothers and children. A complete system of home nursing is now in operation in Bethnal Green. Like many other medical officers of health, Dr. Oates complains that notification of tuberculosis is often too late to be of any value.

Poplar.—Dr. F. W. Alexander's report contains the usual tables, and he sends out with it a reprint of a letter from Dr. J. Graham Forbes on the dangers of the public swimming bath, published in THE LANCET, Oct. 1st, 1921, p. 728. Dr. Forbes pointed out in his letter the risk of contracting catarrhal otitis, ophthalmia, and other diseases, incurred by the users of swimming baths, and that in November, 1912, a committee of the Sanitary Institute had reported favourably on the treatment of bath water by the electrolytic fluid manufactured by the Poplar Borough Council, but that since that date the subject had been allowed to lapse. Dr. Alexander returns to the charge, and emphasises the superior condition of the water in the Poplar baths as compared with that in the average swimming bath as the result of the method adopted.

Edmonton.—Dr. H. W. Harding gives in full the scheme for supplying milk to mothers and children which came into force in December, 1921. The Edmonton day nursery evidently reaches a high standard. The number of attendances during 1921 was 5114 and the cost was £865, which works out at

over 3s. 4d. per attendance. The council runs its own bacteriological laboratory. The new houses erected during the year numbered 93, all part of the municipal scheme.

Finchley.—Dr. Wilson Jameson reports a small outbreak of enteric fever during the last quarter, affecting 10 persons. No cause was ascertained, and there was difficulty in finding hospital accommodation for the cases. The scheme for the joint ownership of Hornsey Isolation Hospital by the three authorities of Hornsey, Wood Green, and Finchley is, however, nearing completion.

Hendon.—Dr. T. S. McIntosh reports a severe outbreak of diphtheria in December. The cases were of an exceptionally severe type. Of 161 samples of milk taken, 21 were reported to be adulterated—a high percentage. The school report shows that ringworm is troublesome, but that the X ray treatment has not yet been adopted. The treatment of dental defects has not been pushed energetically as yet.

Tottenham.—Dr. David C. Kirkhope mentions that notification of tuberculosis is not efficient, and that this is not surprising seeing that the sanitary authority of the district has no administrative control of this disease. Of the 319 new houses 318 are part of a municipal scheme, and one has been erected by private enterprise.

Beckenham.—Dr. J. M. Clements discusses the Greater London scheme, and expresses the opinion that there should be one central governing authority and one local governing authority, and that the establishment of intermediaries is unnecessary and therefore redundant and wasteful. As elsewhere, the phthisis death-rate shows a slight increase as compared with the last two years. The Beckenham and Penge joint maternity home admitted 173 cases during the year. The revenue expenditure was £1951, of which £581 were received from patients. The cost per head was about £11, and the payment per head under £3 10s. Dr. Clements states that there is a real need for more houses of the smaller type, such as are being erected by the council at Elmers End, and estimates that 145 such houses should be erected in Laurie Park and Kent House wards to make the housing accommodation as good as it was in 1911.

Croydon.—Dr. R. Veitch Clark reports the need for an extension of the borough isolation hospital, for better and more accommodation at the sick nursery at 228, London-road, and for the appointment of additional sanitary inspectors to cope with the war arrears of defective housing. Dr. Clark states that a nursing service largely self-supporting was established in 1921, which will in time meet the needs of the whole population. He complains of the time wasted by the professional staff in their endeavour to prevent the abuse of the milk allowances to mothers and children. Croydon council, like a few other sanitary authorities, has made a satisfactory arrangement with the guardians for the supervision of foster children. Dr. Clark points out that the staff of the tuberculosis dispensary is inadequate for the examination of contacts, the most important function of the dispensary. Hospital beds are also needed for diagnostic work. Among the needs of the school medical service are an increase in the dental staff, a school for crippled children, and a greater appreciation of the advantages of open-air education.

SCHOOL MEDICAL SERVICE.

A GROUP OF COUNTY AREAS.

North Riding of Yorkshire.—Dr. H. P. Newsholme's report shows material progress in spite of the present financial stringency. Roughly, one in every four of the 13,505 children examined in routine inspection was found to have some defect requiring treatment. 6·8 per cent. of the children had markedly enlarged tonsils or adenoids. Of 70 children found during routine inspection to require supervision or treatment for deformities rickets was accountable in 12 cases, spinal curvature in 3, and in the 55 remaining infantile paralysis was the chief cause. Of 3079 children referred for treatment on account of defective eyesight, 26 per cent. were attended to. This is an improvement on former years. The distinguishing feature of the report, giving it great value, is an inquiry into visual defect, work often of a tedious character, patiently and carefully done. The testing was done out of doors to avoid variety in illumination. Infants, too, were tested by a special illiterate card. The standards of defect were taken thus:—

(1) Grossly defective vision was 6/12 or less in both eyes, or 6/18 or less in one eye (squint included).

(2) Slightly defective vision—6/9 in one or both eyes or 6/12 or less in one.

Hence a child with normal vision in practical everyday life, but having an amblyopic squinting eye, is returned as having grossly defective vision. The results are given under four headings:—

(A) One child in ten has defective vision, requiring glasses, and one in every other ten has visual defect not bad enough to need glasses.

(B) There are reasonable grounds for concluding that the prevalence of gross visual defects among children increases with increasing urbanisation.

(C) The factors producing excessive prevalence in towns are related mainly to unhealthiness shown from mortality returns and a low standard of physical measurements.

(D) The illumination in schools seems to bear relation to visual defect.

It should be added, however, that the methods adopted for assessing the illumination, either subjectively by the doctor or objectively by means of an actinometer, give deceptive results, even when the one is used to correct the other. The only measurement of lighting to be trusted is by means of foot candles. The mental factor, too, in the lower classes does not appear to receive sufficient allowance, and no mention is made of myopia in respect to age. Nevertheless, such an inquiry is of great interest and use to workers, and brings out much in school hygiene that has had too little attention given to it in the past.

Norfolk.—In this county Dr. J. T. C. Nash advocates restraint in the case of enlarged tonsils and adenoids where operation is not absolutely urgent at the moment, and by means of a pamphlet entitled "Adenoids," the parents are appealed to as intelligent coöperators in securing the amelioration of the condition. The pamphlet contains simple reasoned instructions, and one of the assistant medical officers states his opinion that mouth breathing is the root cause of most of the cases of underweight. During the year over 9 per cent. of 17,000 children examined in the code groups showed evidence of throat and nose affection, and 267 were operated on for enlargement of tonsils and adenoids. Dr. Nash reports that many cases of moderately enlarged tonsils and adenoids improve with the systematic use of gargles and insufflations of simple saline solution, and this, accompanied with breathing exercises, ought to do much to diminish the number of cases requiring operative treatment. Rickets is an uncommon cause of crippling here, the majority of the 200 cases being due to infantile paralysis. The amalgamation of the nursing and school attendance work appears to be justifying itself, and it is to be hoped that this close association between the home and public health department will do something to foster a health conscience among the people, which is the aim of all up-to-date endeavour in this field of hygiene. Certainly, this seems to be the case in this county, for in 15 schools all the children were found to be perfectly free both from nits and vermin. The organiser of physical training reports that in 90 per cent. of the schools visited by him the girls were more alert and energetic than the boys, as proved by competitive work under the team system. Is this a reflection on the efficiency of the male teacher?

Northamptonshire.—The number of routine examinations made in 1921 was 7183, in addition to 1200 "specials," and of the 700 cases requiring treatment 600 received it. The extent of uncleanliness appears

considerably greater than in previous years, and Dr. Charles E. Paget is making every effort by means of nurses and lectures to improve this state of affairs. The definite inclusion of teachers in this effort is a healthy sign. Their possibilities in any health campaign can hardly be overestimated. The teacher is closer to the child and to the parent than any other public official and is the real link between the home and the school. Dr. Paget also employs the teacher to supervise breathing exercises in such cases of nasal obstruction as do not require operative interference. There was a diminution in the number of new tuberculosis cases during the year, 23 as against 72 in the year 1920. Of these, 5 were definitely diagnosed and 14 were suspected cases of pulmonary tuberculosis. The remaining 4 were non-pulmonary. The total number of cases of external eye disease was small, only 76 altogether. Infectious disease, which last year accounted for the closure of 88 schools, this year was accountable for exactly half that number. The nursing scheme outlined in the report for the previous year is working well, and towards the end of the year there was obvious improvement in the cleanliness and general tidiness of the children. The new clinic for minor ailments held in one of the schools in Wellingborough had 2365 attendances during the year. The charge made for treatment is sixpence per child, and this covers all attendances for four weeks from the date of payment. The clinic is also used for refraction and dental work.

Rutland.—Dr. Christopher Rolleston complains of the extreme detail required by the chief medical officer, and states that it was only by taking no holiday that he was able to send the figures in by the first week of the new year. "It is not apparent," he says, "that these extremely dull compilations, which consist of snippets from reports, are of any value to school medical officers or of any interest to the general public. The apparent object of the medical department is to make the work as laborious as possible, to kill any interest and initiative, and to make the school medical officer a recorder of useless data." The last indictment seems true of much of the work. It is interesting to note that the appointment of a nurse in this county has been so very satisfactory. The total number of examinations under the code group was 679. The number of refusals was large. In 37 instances letters of refusal were received by the head teachers, and many children were absent. "The nurse is frequently asked 'Is it compulsory?' not 'Is it for the good of the child?'" It is interesting to note that since vaccination has been made voluntary the registers are practically empty. Dr. Rolleston found nothing to support the theory that enlarged tonsils and adenoids predispose to dental disease. The report is full of pithy observations, and makes interesting reading.

Kent.—Dr. Greenwood's report is as on previous occasions full of interest. Of 32,988 children inspected during 1921, 9262 had some defect, the majority coming under the heading of nose and throat affections, dental trouble, and defective vision. Tuberculosis accounted for 73 cases of crippling in the county, and of these 59 are in attendance at the ordinary elementary school. There is close coöperation in Kent with child welfare centres and women's institutes, who arranged lectures on dental care at various centres. Talks with the children on this matter form a routine measure during school inspection. The total percentage of dental defect—viz., 67·8—is lower than that for the previous year on account of the inclusion of the 5-year old group. The number of children requiring treatment was 1836, and of these less than half received treatment; lectures to parents should remove their apathy. There are four permanent and ten temporary clinics in the county. An investigation into the causation of the dull and backward child revealed improper environment as the greatest factor. Heredity takes second place and physical defect comes third. Attention is drawn to the "astounding difference" existing between schools in adjacent or even contiguous villages in respect to physical and mental alertness, and it is noted that the condition reflects the social and sanitary condition of the villages concerned. It might be added that the aggregate physical and mental condition of the children in a village taken with the general atmosphere in a village school, is a very good criterion of the ability of the head teacher there. The extensive investigation into school furniture begun the previous year was continued and the character of the seating accommodation for 44,379 children is now given.

Numbers accommodated in forms without backs	..	12,880
" " " with "	..	4,720
" " at dual desks	..	22,859
" " with chairs and tables	..	3,920

It is to be hoped that the large number of these old backless forms will shortly be reduced. The number of sanitary conveniences even in the best-equipped schools is considerably below the Board of Education requirements.

ASYLUM MEDICAL SERVICE.

In the annual report of *Murray's Royal Asylum, Perth*, it appears that no less than 41 of the 198 patients treated during the year were admitted as voluntary boarders. Gratifying as this proportion may be, the medical superintendent is of the opinion that certification could have been dispensed with in a number of other cases, and he urges the advantages of voluntary admission whenever possible. Strong emphasis is laid on the frequent association of toxæmias with mental disease, and "unsatisfactory physical health" is noted in the majority of patients on admission, due in most instances to such conditions as oral sepsis and intestinal stasis. It is also recorded that ordinary treatment brought about marked improvement in these respects. Assuming that, as Dr. Chalmers Watson believes, these complaints play a part in the production of mental disorder, we submit that a record of the effects of treating them would be of great interest. The statistical tables given do not provide this information. In what proportion of the recoveries did mental improvement follow the cure of a physical disease? In how many cases and in what types of insanity such treatment failed to affect the mental condition, does not appear in the tables. If a number of mental hospitals collected precise information along these lines, the causes of recovery in mental disease might lose some of their obscurity. The names of two clinical clerks appear in the list of officers to this institution.

The annual report of the *West Sussex County Mental Hospital* reveals the fact that five wards in this institution are empty, and it is recommended that some of these should be devoted solely to the care of idiot and imbecile children. A few such children are at present accommodated in the adult wards, an arrangement open to strong objections, and others would be admitted if more suitable provision were made for them. It is also recommended in the commissioner's report that patients should have greater freedom of access to the airing grounds, rather than be exercised there only for a stated period on each fine day. This hospital possesses a consulting staff of five members, and an account is given of the valuable work done by them, including a number of surgical operations and a large amount of dental work.

Some of the larger mental hospitals produce their own magazines. We have received two numbers of the *Morningside Mirror*, which is a good example of productions of this kind. Its features include a serial story, by whose agency the reader of the July issue is left in a state of puzzled suspense, an account by a "Service patient" of his experiences in Asia Minor, and entertaining records of the various social activities of the institution. We are convinced that such a magazine is a valuable asset to a mental hospital, providing both employment and entertainment, and emphasising, as it does, the community of interest between staff and patients.

Correspondence.

"Audi alteram partem."

CLAYDEN *v.* WOOD-HILL.

To the Editor of THE LANCET.

SIR,—Will you kindly allow me to thank the Council of the British Medical Association for the help it gave me, on the announcement of the verdict given against me, in the case of Clayden *v.* Wood-Hill. Its offer of legal assistance and its sympathetic attitude I most deeply appreciated.

I owe a great debt of gratitude to Sir Hamilton Ballance and the signatories of the appeal fund, which raised so large a sum (£1731) to meet the financial loss which the case entailed. As may be realised the sum so subscribed has been of the greatest relief to me, but great as that relief has been, the feature that has given me the more satisfaction is that the leading men of the profession, with so vast a number of my professional brethren, men representative of all parts of the British Empire, and mostly personal strangers, should have rallied so generously to my aid. It bespeaks the view taken by our profession as to the injustice of the verdict. As an expression of good fellowship it is most remarkable. It has been to me a rainbow in a stormy sky.

The practice of our profession calls for courage and confidence; my colleagues have helped me to retain both. They may rest assured that I shall apply my powers, such as they are, conscientiously, and in good faith, without regard to fortune good or bad. "Of good fortune man should not be proud, for it is a present to him; at bad fortune he should smile, for the Fates have singled him out to try his courage."

I am, Sir, yours faithfully,

H. WOOD-HILL.

Staithe House, Beccles, Suffolk, Sept. 2nd, 1922.

SANATORIUM BENEFIT.

To the Editor of THE LANCET.

SIR,—Sanatorium benefit has now been in existence for ten years; I contributed to THE LANCET of March 29th, 1913, an article giving my early impressions of the working of the Act. It is impossible to deal completely with so large a subject in a letter, and therefore it may be best to try to answer some of the outstanding questions of sanatorium benefit, and thus to bring before the profession the far from satisfactory condition of the system.

(1) *Has Sanatorium Benefit been a Success?*—After ten years' work at sanatorium benefit it may be of use if I try to comment impartially on the movement and its side issues. Undoubtedly the backbone of sanatorium benefit is the general practitioner, whose services, in my opinion, have never been properly appreciated by either the bureaucracy or the general public. Sanatorium benefit was the sugar-coating of the National Insurance Act, which was disliked and suspected by the profession, but no medical man was opposed to sanatorium benefit provided a reasonable and efficient proposal was set on foot. The Astor Commission's report was Utopian on paper; had the country and the leaders of the profession been able to live up to it, its success would have marked an era in the history of medicine in Great Britain. The only thing which, in my opinion, stultified the report was the great lack of properly qualified tuberculosis officers to carry the scheme to success. Sanatorium benefit began to fail when the Local Government Board allowed a local authority to appoint a man with no experience of tuberculosis. The work of a tuberculosis officer is entirely consultant, and as soon as the general practitioner found out that his knowledge was as good as, and often very superior to, that of the pseudo-consultant, sanatorium benefit was doomed; he stopped calling in the tuberculosis officer in suspected or obvious tuberculous cases, and simply used him as a clerk to fill up the needful papers to get his patient away to a sanatorium. The modesty of the general practitioner is notorious; his kindness, unappreciated by the public health authorities, made him refrain from ventilating his opinions in the medical press or through his local Member of Parliament, with the result that sanatorium benefit gradually sank into its present condition. The war affected the movement adversely, but it had no material effect on the asylum movement; for example, the failure of sanatorium benefit was due to the lack of proper Government administration. The lack of money, a by-product of the war, has of necessity caused curtailment, but I claim that sanatorium benefit had begun to fail before August, 1914. During the ten years the experience gained by tuberculosis officers must be unique, and I personally have come across tuberculosis of most of the organs, but few of the cases met were worth publishing—although it is a great pity that specialists do not publish more cases, as they forget that what is ordinary to them has interest and affords instruction to the general practitioner. Unfortunately my remark in THE LANCET[1] to the effect that the general practitioner was, owing to the presence of tuberculosis officers, examining his cases better and taking more interest in them, cannot be held to be true to-day—partly owing to the appointments made, partly owing to the general practitioner's work having so greatly increased. To-day his power of diagnosing early cases is generally much worse than it was in 1912. There are obviously numerous exceptions; many practitioners have taken the movement seriously and have learnt from their district tuberculosis officers, but the exceptions only prove the rule. It is attractive to try to express the success of a movement in percentages; and I suggest the following figures, relating to the success of sanatorium benefit: (1) Partial success, 25 per cent.; (2) partial failure, 25 per cent.; (3) complete failure, 50 per cent. These percentages, if even approximately true, completely answer my first question. I have arrived at these conclusions by consulting the opinions of various general practitioners, and by reading and by conversation with others equally interested in the success of the movement. The general practitioners were those living in cities, towns, and in the country places, and they were looking at the question purely from the patients' point of view—i.e., the only and right way. In no way should sanatorium benefit be a political problem.

(2) *Has the Notification of Tuberculosis been a Blessing or a Curse?*—Undoubtedly, from the clinical standpoint, a curse. The psychological effect on the consumptive of being notified in a manufacturing town, and of going to a watering-place, then to an inland watering-place, and so on, has materially affected the prognosis; he has come to feel he is a pariah. I do not consider that either Harley Street or the general practitioner is ignorant of this fact; as a profession we are not carrying out the statutory obligation imposed on us. By notification we are not likely to get hold of the so-called early case. From the public health point of view it is doubtful if the notification has done any real material good; the results of "charting" the location of cases in cities, towns, and country places have been extraordinary. The tubercle bacillus is omnipresent, and this may be the explanation. The notification of non-pulmonary cases is not, in my opinion, justifiable, and the notification of pulmonary cases is subject to considerable objection.

(3) *Have Sanatoria Failed?*—It would be ridiculous to say that the famous sanatoria, headed by the King Edward VII. Sanatorium, Midhurst, and Frimley Sanatorium, have in any way failed, considering their staffs and consulting staffs, but there are far too many pseudo-sanatoria throughout the country—simply homes for consumptives where no proper and rational treatment is attempted, which do not deserve a better

[1] THE LANCET, 1913, i., 913.

name than convalescent home in which consumptives are allowed. As Dr. Marcus Paterson has repeatedly told the profession, a sanatorium depends entirely on its medical superintendent and its staff. Each county or each area ought to have been forced to build a properly-equipped sanatorium; farming out beds is expensive, and in far too many cases inefficient. State-endowed, State-run sanatoria might well solve this question, although at present finance may not permit of it. Education of the consumptive is of public health importance, and in properly-run sanatoria is stressed by lectures given by the staff. That a sanatorium gives a certain class of patient the best chance of recovery cannot be gainsaid; but certain other early cases are damaged for life, for it depends on the patient's psychology. On the whole, it is better not to mix advanced and early cases, but it is better to mix them under good administration than to send them to ill-run institutions.

(4) *Should we Adopt the Army Method of Diagnosing Tuberculosis by the Presence of Tubercle Bacilli in the Sputum?*—I understand that this ruling was drawn up by a board of leading civilian specialists in conjunction with military and naval doctors; had it been rigidly adhered to in the recent war, there would not have been the large number of ex-Service men, who probably never had the disease, still receiving pensions to-day. The ex-Service men are being extremely well treated on the whole, and when, or if, finance rights itself, it might be feasible to grant a proportionate relief during illness to all insured and uninsured consumptives. From the public health point of view this would pay, but the question would have to be gone into very carefully by Government accountants in conjunction with the insurance committees and the friendly societies, &c.

Would it sound like heterodoxy to suggest that although the tubercle bacillus fulfils the postulates of its discoverer, some prodromal bacillus, lying dormant in the mouth, may be the real cause of tuberculosis? Everyone with experience must have been struck by the failure of the bacteriologists in obvious cases of tuberculosis to demonstrate the T.B.; again, such an organism would clear up the diagnosis in pre-tuberculous (an objectional and unscientific word) cases. Its discovery would partially revolutionise our ideas on tuberculosis; if found it would give new hope of finding a cure. The failure of sanatorium benefit has to the lay mind been obvious in that public money is and has been spent with such little apparent result, and one cannot expect local authorities to look a hundred years ahead. If tuberculin had even partially succeeded, the position of affairs would not now be so bad. If the supposition is correct that the T.B. is not the only causative organism, and another entity were found, plenty of money would be forthcoming. Artificial pneumothorax has been the one and only advance in treatment for many years, and clinicians realise in what a fractional percentage of cases it has been of material use.

(5) *Why is Tuberculin so Little Used?*—I used tuberculin for a long period and would use it now were things more settled; in certain cases, both pulmonary and non-pulmonary, it undoubtedly did good. It is the greatest pity that it is falling into disrepute. I only remember one case where I thought it did material harm, but in the hands of inexperienced men it is dangerous.

(6) *Are we as a Race being Immunised against Tuberculosis?*—If it is true that as a race we are becoming immunised against syphilis, I have always failed to see why we are not also becoming immunised against tuberculosis. One is caused by a spirochæte and the other by a bacillus, but may not this be a bacteriological quibble, or may the suggested prodromal entity be a spirochæte? That public health measures, prosperity, housing, better food, &c., are all factors none can deny, but we want something further to account for the present position of affairs. Can it be that some resistive power in the impregnated ovum is more potent than it used to be, and that this resistive power gives an almost complete immunity for two years or so? This would explain the extreme rarity of a positive von Pirquet in early life. The subject is too complex for a clinician to attempt to discuss.

(7) *Do Children under 12 get Pulmonary Tuberculosis?*—Such cases are in my 14 years' experience very rare indeed. The tuberculosis pendulum has swung to such an alarming extent that physical signs are found, or theoretically found, in a tremendous number of contacts. It is notoriously impossible to determine physical signs in children, and it is a crying shame that such cases should be notified on one or two examinations only. The stigma attached to a notification often damns a child's future; it is entirely wrong that this should be so, but the fact remains. No child ought to be admitted into a children's sanatorium unless the diagnosis is absolutely definite; the right place for these children is a convalescent home or an open-air school run on rational medical lines.

The life of a tuberculosis officer is extremely interesting and varied. The pay is ridiculous, and the sooner the public health service is put on a proper footing, the better for the country. The clinician ought to be paid only a little less than the administrator. If the failure of sanatorium benefit is thought to be due to the administrators, why not let the clinician see if he can administer what is obviously a clinical matter? Might I suggest a second Astor Commission? The experience and the 10 years' working of sanatorium benefit would help to find some solution of a problem that does not brook delay. I am, Sir, yours faithfully,

Chelmsford, August 22nd, 1922. JAMES D. MACFIE.

PAY IN THE NAVY.

To the Editor of THE LANCET.

SIR,—I am glad to see that in your last annual Students' Number you have been able to point out both the opportunities and drawbacks of the career put before officers of the Royal Naval Medical Service. The profession must shortly take into serious consideration the conditions of service of its younger members who, with little experience of the world, volunteer for service in the navy and the army. These young doctors, without much idea of the rewards of medical practice capably pursued, accept service under contracts which appear to promise them a definite and desirable future. Private practice seems risky and uncertain, the pay and retirement schedules of the services seem definite and encouraging, and the ingenuous candidates give little thought to the ever-impending danger that their contract is one-sided, that they can be held to their bargain, but that nothing they may do can compel these Government departments to implement the promises on which these young men rely when they place their lives and services at the disposal of the State. For years before the war things went on, on the whole, fairly, but since the war it has been definitely decided by the Courts that a man promised 6*s.* a day by the War Office may, if it tires of its bargain, be forced to accept the 2*s.* it may think enough for him, while he must go on serving nevertheless. In other words, no individual has any redress against the Government, against the War Office, or the Admiralty, if the conditions of his service are, by authority, varied, however much the variance is to his disadvantage. Where, then, has the medical officer any security? Only in the sympathy of his civil professional brethren evidencing itself in the considered declarations of the leaders of the profession, and in their definite warnings to the oncoming students, as they join the ranks of qualified practitioners, that it is unwise of them to join the Services. And as the Admiralty has recently broken faith with senior medical officers one welcomes the advice given by Sir Richard Luce, and the motion proposed by Sir Jenner Verrall and adopted by the representative meeting of the British Medical Association at Glasgow, impressing seriously on all newly

qualified men the disadvantages to which they become liable if they place their careers in the hands of the Admiralty. For the Admiralty gives medical officers far less consideration than does the War Office. The Admiralty gives its medical officers little more than individual employment at gradually increasing rates of pay. The War Office gives its medical officers an almost autonomous corps, the opportunity of a very advanced education, and scope for ambition in a more than respectable career. Consequently the army has for years attracted many capable recruits, and has had great returns from them, as everybody knows. Another thing; when differences arise which the civil profession considers serious, the War Office, in close touch with the leaders of the profession, is prepared to discuss the difficulties and to receive if necessary deputations from conferences about alleged grievances which may then be explained away. The Admiralty takes another view. Its decisions are right, for it has made them, and are not to be changed however unjust they may appear. Perhaps it is the penalty of long years spent at sea, but the outlook of the Admiralty is sometimes narrow and even pedantic. Thus in the case which is just now causing so much discussion and indignation in the profession, the Admiralty hit upon a simple scheme: all officers of commander's rank to retire at 50. Most officers in the navy join it at 13, nearly all the others at 18; their education is mostly provided for them free, and they are self-supporting, if they choose, from the age of 21, so by the age of 50 they have had 30 years' remunerative employment with little capital expenditure to be reaccumulated. The medical officers of the navy, on the other hand, are not likely to join before 23; for ten years longer than the executive officers they have been at their own cost fed and lodged and given a long and expensive training. They were told when they joined that they might expect 32 years of paid service, and to this they looked forward as a reward for their industry, to recompense them for the early difficulties of self-adjustment to their new environment, and to re-establish their original capital. Now, as is usual, the cream of the financial benefit was found in the last five years, for which officers are promised pay at £1040 per annum. Besides, if officers of such seniority have done their work well in the past, these last five years are apt to be spent in positions of some dignity, with official residences and extra allowances which help towards the education of children and in meeting insurance payments. There appeared no reason for the discharge of these officers. They had all served through the war, with no less strain than that encountered by their juniors in the Service; they were not yet physically worn out, yet they were pushed out of the Service in the fullness of their professional and naval experience. Why was faith with them not kept? The only apparent reason is that the Admiralty desired to make an artificial uniformity in the retirement of all branches; at any rate the department will not confer with the profession and explain their action. They have gained an official simplification, they have made medical men suspicious, and they have reminded us all of the bed of Procrustes, who was a robber.

I do not desire to prevent any young doctor, enthusiastic about the sea, from joining a Service which, above all others, requires to be served by enthusiasts; but unless a man has such definite interest in the sea it is well that he should be advised of his unwisdom in taking service under the Admiralty just now, for, as so many temporary surgeons found, he will work within a narrow professional horizon, his pay will on the whole be less than in the army, he will have no married allowances, his fewer amusements will probably cost him more, and he will always be anxious lest while his duty must be done fully the promises held out to attract him to it may be only in part performed.

I am, Sir, yours faithfully,

Sept. 1st, 1922. DISINTERESTED.

CLINIC EXPERIENCE IN CONTRACEPTION.

To the Editor of THE LANCET.

SIR,—I have no desire to enter, through your columns, into controversies on medical subjects with non-medical persons; but the letter of Mrs. Marie Stopes, D.Sc., in to-day's issue refers to me in such a way as to call for a reply.

I regret that she should think I had any intention of "jibing" at her. Nobody realises more than myself the immense service of Dr. Stopes in popularising the knowledge of birth control in this country. It is because I realise her power so keenly that I so much regret that she has abandoned her scientific attitude and discredited herself in scientific circles by publishing a volume entitled "A New Gospel to All Peoples," in which she makes the explicit announcement that she is a prophet, and claims to have received a direct revelation from God on the subject of birth control. A person who is capable of deluding herself, or seeking to delude others, with such a belief, is no longer to be treated as a scientific investigator.

As regards the gold-pin pessary I am informed by a member of Dr. Stopes's own committee that she arranged a meeting of medicals to consider the gold-pin, with the result that its use was condemned. She has omitted to mention that at the Medical Section of the American Birth Control Conference, held in New York in 1921, the gold-pin was condemned by an overwhelming majority of the 400 medical men and women present. I am *still* "ignorant of the fact that the pin is used by leading American practitioners in the U.S.A."

I did not allege that the pin was *used* at Dr. Stopes's clinic. I said its use was *advocated* there. It certainly was formerly; whether it still is, I cannot say.

I am, Sir, yours faithfully,

NORMAN HAIRE.

New Cavendish-street, W., Sept. 2nd, 1922.

To the Editor of THE LANCET.

SIR,—In response to the challenge of Dr. Norman Haire to name the physiological objections I have to the Dutch cap he prefers to use,[1] may I first welcome the fact that Dr. Haire has recently rewritten the practical instructions issued by the Malthusian League, so that they now accept my *main* thesis—viz., that the best form of contraceptive is an internal rubber cap worn by the woman. The differences between the different varieties of cap are minor though not unimportant.

My two main objections to the Dutch cap preferred by Dr. Haire are, put very briefly: 1. It must be worn so as to cover the whole end of the vagina and depends on stretching the vaginal walls for its power to remain in position. For the same patient the diameter of the Dutch cap necessary is very much greater than that of the occlusive cap which does not stretch the vagina. The Dutch cap then stretches the vagina in such a way that certain movements of physiological value (particularly to the man), which ideally the woman should make, are then impossible. It is true that few women either know or practise complete physiological union in coitus, but that is no reason to justify the advocacy in general for normal women of an instrument which inherently prevents certain natural and valuable movements. The Dutch cap, however, is really useful for slightly abnormal cases, such as very fat women, those with injured cervices, &c. 2. My second objection is that it covers all the tissues at the end of the vagina, and near the cervix, and these tissues are among the most sensitive (and probably absorptive) of the woman, and it is not good that they should be needlessly covered; they are not covered by the small occlusive cap.

For these and other reasons I think the Dutch cap inferior to the small occlusive for normal women.

I am, Sir, yours faithfully,

Holloway, N., Sept. 2nd, 1922. MARIE C. STOPES.

[1] See THE LANCET, August 12th (p. 357), 19th (p. 419), Sept. 2nd (p. 539), 1922.

To the Editor of THE LANCET.

SIR,—At the public meeting referred to by her (THE LANCET, Sept. 2nd), Dr. Marie Stopes suggested that the condemnation of the gold-pin in England and its approval in U.S.A. was due to a difference in technique. I understand from leading medical authorities that this suggestion is quite correct—that is, the English "technique" is to refuse to insert the gold-pin (as liable to cause septic miscarriage) and the American "technique" is to insert and remove the gold-pin once a month and charge $20 for doing so. Hence the "success" of the gold-pin in America.

I am, Sir, yours faithfully,
ETTIE A. ROUT.

Queensborough-terrace, W., Sept. 4th, 1922.

*** The origin of this correspondence is indicated by its title, but it has now got into regions of personal and more or less unassociated controversy where few can want to follow it. We do not propose to publish further discussion in these directions.—ED. L.

SOME EXEMPTION FOR THE PROFESSIONAL CAR.

To the Editor of THE LANCET.

SIR,—There is a matter which I think with advantage might be taken up by the profession, and that is why medical men and veterinary surgeons should not be granted a reduction of the tax on their motor-cars. I think I am correct in stating that they are the only car owners who use their cars for professional or business purposes who do not receive an abatement of the tax, which bears very hardly on medical men at the present time.

Possibly, if this matter was ventilated and the hardship represented to the powers that be some relief might be obtained. I enclose my card and remain,

Yours faithfully,
"CAR OWNER."

August 27th, 1922.

*** We have never heard any satisfactory reason why this proposal, which is not at all new, receives no wide support.—ED. L.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Capt. W. H. S. Stalkartt placed on retired list with rank of Surg. Rear-Admiral.

The following appointments are announced:—Surg. Capt.: T. J. Jeans, C.M.G., to *Vivid*, addl., for R.N. Hospl., Plymouth. Surg. Cmdrs.: H. M. Braithwaite to *Valiant;* A. R. Fisher to *Champion;* S. W. Grimwade to *Ceres* (on recommg.). Surg. Lieut.-Cmdrs.: L. W. Gemmell to *Pembroke*, for R.N. Hospl., Chatham, for general specialist duties; P. L. Gibson to *President*, addl., for three months' hospl. course; and G. E. D. Ellis to *Concord*. Surg. Lieut.: T. N. D'Arcy to *Ceres* (on recommg.); H. L. Pridham to *Glowworm*, and for group.

P. C. H. Homer to be Surg. Lieut.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. M. M. Lowsley retires on retired pay.

MILITIA.

Supplementary to Units or Corps (R.A.M.C.).—Capt. R. L. Horton relinquishes his commn. and is granted the rank of Maj.

TERRITORIAL ARMY.

Maj. S. J. Fielding to be Lt.-Col. and to command 54th (E. Ang.) Field Ambulance.

Capt. J. H. Owens to be Maj.

Capt. L. Milton relinquishes his commn. and is granted the rank of Maj.

Capt. J. Muir, having attained the age limit, is retired and is granted the rank of Maj.

Capt. T. Murray relinquishes his commn. and retains the rank of Capt.

The undermentioned officers resign their commns. and retain their rank except where otherwise stated: Maj. J. H. Dixon (with permission to wear the prescribed uniform); Capts. K. I. S. Smith and H. M. Calder (granted the rank of Maj.), R. Welch, E. W. Strange, E. B. Kitching, A. G. McFarlane, H. Evers, G. J. Linklater, F. L. Golla, W. R. Sadler, W. J. Scade, R. W. Smith, and H. P. Ashe.

General Hospitals: Maj. A. P. Watson, from General List, to be Maj.

Sanitary Service: Capt. J. M. Hamill relinquishes his commn. and is granted the rank of Maj.

Sanitary Companies: Capt. H. H. Fowler from T.A. Res. to be Capt.

TERRITORIAL ARMY RESERVE.

General Hospitals: Lt.-Col. C. A. Lees to be Lt.-Col.

Capt. R. J. McConnell relinquishes his commn. and retains the rank of Capt.

ROYAL AIR FORCE.

The undermentioned are granted short-service commns. as Flight Lts.: J. K. Ritchie Landells, J. A. Musgrave.

C. A. Harrison is granted a temporary commn. as a Flight Lt.

INDIAN MEDICAL SERVICE.

Senior Assistant Surgeon with rank of Major: M. M. O. J. Apcar.

Senior Assistant Surgeon with rank of Lieutenant to be Senior Assistant Surgeon with rank of Captain: J. G. Williams (to remain seconded), A. T. Torpy.

To be temporary Lieutenant: P. A. C. Davenport.

Maj. W. T. McCowen to be acting Lt.-Col. while comdg. No. 712 Combd. Field Ambulance.

Maj. (acting Lt.-Col.) W. T. McCowen retains his acting rank while comdg. No. 11 Combd. Field Ambulance.

The King has approved the resignation of the following officer:—Captain and retain the rank of Captain: H. E. Magee.

The King has approved the retirement of the following officer: Lt.-Col. J. Penny.

Following a correction in the *London Gazette* of August 29th, for "Captain Eric Douglas Mackay Heriot-Hill, R.A.M.C.," in the notice which appears on p. 417 of THE LANCET of August 19th, read "Captain Eric Douglas Mackay Heriot Hill, R.A.S.C."

DEATHS IN THE SERVICES.

Surg. Rear-Admiral GEORGE TREVOR COLLINGWOOD, C.B., M.V.O., who died on Sept. 2nd at King Edward's Convalescent Home, Osborne House, Isle of Wight, had been a patient there since last April. He was born in 1863, and received his professional training at the London Hospital. Having qualified as M.R.C.S., L.R.C.P. Lond. in 1886, he entered the navy in the following year. For his services on three expeditions in the Gambia River on the West Coast of Africa he was mentioned in despatches. He served on the Benin River in 1894, and was senior medical officer in charge on the Brass River in 1895, and was awarded the general Africa medal with three clasps. From 1909 to 1912 he was P.M.O. at the Royal Naval College, Osborne, and was formerly in charge of the Royal Naval Hospital, Chatham. During the war he served in the *Inflexible* and in the naval hospital ship *Soudan* in the Dardanelles. His last post was at the Royal Naval Hospital, Malta. He was a Fellow of the Society of Tropical Medicine and was awarded the Sir Gilbert Blane gold medal of the R.C.S. Eng. in 1910.

Col. EDWARD HORACE LYNDEN-BELL, C.B., late A.M.S., who died on Sept. 1st at Millbank Hospital, was the son of Maj.-Gen. T. Lynden-Bell, of Brook Hill, Co. Wexford, and was born in 1858, and qualified M.B., C.M. Edin. in 1882. He served in Burma from 1885–89, receiving the medal and two clasps, and became Deputy Director of Medical Services, London District, in 1912. In the late war he served from 1911 to 1917, and received the C.B. He was a Knight of St. John of Jerusalem.

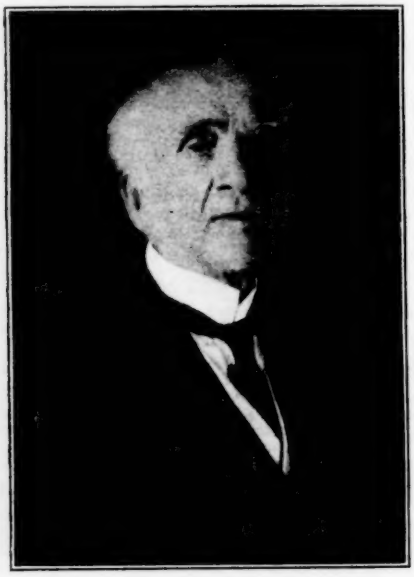
Inspector-Gen. HENRY MACDONNELL, C.B., R.N., retired, who died on August 31st at Southsea, aged 83, was the son of William Macdonnell, of Dublin. He qualified as L.R.C.S. Irel. in 1860, and L.R.C.P. Irel. in 1861, and entered the navy as surgeon in that year, being ultimately promoted to Fleet Surgeon in 1882, and Inspector-General of Hospitals and Fleets in 1897. He was Fleet Surgeon of the *Invincible* at the bombardment of Alexandria in 1882, and served during the subsequent Egyptian War. He had been Deputy Inspector-General at Haslar, Malta, and Chatham. He was Inspector-General of Hospitals and Fleets in 1897 and retired in 1899. He was awarded the C.B. in 1897.

WALLASEY: SALARY OF M.O.H.—The medical officer of health of Wallasey having been appointed to Gillingham, the corporation decided to advertise for a successor, at a salary of £600. The British Medical Association pointed out to the corporation that this salary was inadequate for a medical officer of health who had also to attend to tuberculous and venereal cases, and was below the standard fixed by the Association. It was thereafter resolved to offer £700, rising in four years to £800.

Obituary.

STEPHEN SMITH, M.D. NEW YORK.

Dr. Stephen Smith, who, as we briefly reported last week, died on August 26th in his hundredth year, was born in Onondaga County, New York, in 1823. He selected medicine as his profession at an early age, beginning his medical studies whilst still attending high school. In 1850 he entered the College of Physicians and Surgeons, New York, and graduated in the following year. In 1854 he became a surgical and clinical teacher at Bellevue Hospital Medical School, and continued his work in that capacity till 1891; from 1863 to 1870 he also held the post of Professor of Anatomy. In 1864 he was made a member of the Council of Hygiene of New York city. The report of the Council, published in the following year, which dealt with the investigations organised and



STEPHEN SMITH, M.D.

supervised by Dr. Smith, was instrumental in bringing about the creation of the Metropolitan Board of Health in 1866. The Board received very extensive powers; Dr. Smith was appointed a commissioner, and through successive reappointments remained in office until 1875.

Among his many important and varied appointments was that of United States Commissioner to the Ninth International Sanitary Convention held in Paris in 1894. He sat on city, State, and national boards of health, and was a commissioner in lunacy. Early in his career Dr. Smith became a contributor to medical literature. During the Civil War he published a handbook on surgical operations; in 1887 appeared his "Principles and Practice of Operating Surgery," which became a standard text-book and ran through several editions. From 1863 to 1870 he was editor of the *New York Journal of Medicine*, and from 1860 to 1864 editor of the *American Medical Times*. His book, "The City That Was," published in 1911, gave a description of the insanitary conditions of New York city before the creation of the Metropolitan Board of Health; this work was reprinted in 1921 in honour of the "semi-centennial" of the American Public Health Association. Of the Public Health Association Dr. Smith was founder and first president; in November of last year, during the celebration of the jubilee of the Association in New York,[1] Dr. Smith was the guest of honour at a banquet given to mark his approaching centenary, which so nearly coincided with the conclusion of 50 years' work of the organisation created by him in 1872. Dr. Smith is credited with the statement that "every man who dies before a hundred, practically speaking, dies by his own knife and fork." His own rules for longevity included the eating of a minimum of meat, and the drinking of quantities of milk ("if it disagrees with you, drink more"); ten hours' sleep, out of doors if the weather permits; avoidance of tobacco, sweets, and alcoholic or other stimulants; avoidance, also, of the easy chair—"absence of work is the first step to the grave"; and finally, the advice "Just be natural; quit all foolishness."

Dr. Smith was for some time the New York correspondent of THE LANCET, and for over 30 years was a frequent contributor.

[1] THE LANCET, 1921, ii., 769.

JAMES DONELAN, M.B., M.CH., B.A.O. R.U.I.

Dr. James Donelan, who died on August 25th in his sixty-sixth year, received his medical education at Trinity College, Dublin, graduating M.B., M.Ch. with honours in 1886, becoming L.M. in the same year. In 1889 he graduated B.A.O.R.U.I., and amongst his appointments was that of surgeon to the nose and throat department at the Italian Hospital, Queen-square, London, W.C., where he showed himself a capable and ingenious laryngologist. In 1909 he was made Chevalier, and in 1918 officer of the Order of the Crown of Italy. A Fellow of the Royal Society of Medicine, he was a member of the Council of that body and President of the Section of Laryngology in 1918 and 1919.

During the war, from 1914 till 1916 he was medical referee to the London Committee of the French Red Cross, and in 1914 was surgeon in temporary charge of an ambulance hospital at Crépy-en-Valois (Oise). In the early period of the war he rendered considerable service by organising a system under which British and colonial surgeons could aid the French medical services, for in coöperation with the French Embassy he arranged a rota plan which enabled many medical men to render service for short periods. By the third year of the war such efforts were superseded by the general need in the different British forces for all the available men upon the Medical Register, but by that time national interplay was established, and the medical staffs of various countries reinforced each other at weak spots. From 1915 till the end of the war Dr. Donelan was a member of the Royal Italian Military Medical Commission for recruiting, and for his services received his promotion in the Order of the Crown of Italy. Other appointments held by him were those of lecturer on diseases of the nose and throat, Medical Graduates College, London, and honorary physician to the Royal Society of Musicians. Of his many contributions to the medical journals, several appeared in the columns of THE LANCET.

Dr. Donelan's death was sadly abrupt. He was a cardiac subject, and had been in poor health for some time; he collapsed suddenly and died immediately after a hearty meal.

DAVID SHARP, M.A., M.B. EDIN., F.R.S.

Dr. David Sharp died on August 27th at his residence at Brockenhurst, Hants, in his eighty-second year. Receiving his medical education at St. Bartholomew's Hospital, London, and at the University of Edinburgh, he graduated M.B., C.M. in 1866. He engaged for some time in medical practice, but his real interest lay in entomology. This proclivity was fostered by Herbert Spencer, who during Sharp's boyhood lived in the latter's home and took an interest in his early studies. Soon after Sharp had taken his degree the Entomological Society of London published a monograph by him on British Homalota. He followed this up with studies of the insects of New Zealand, of water-beetles, and of the beetles of Central America. In 1885 he was invited to Cambridge. There he spent 19 years, working chiefly on the insects of the

Hawaiian Islands; the results of this work were published by the Royal Society. He became curator of the Museum of Zoology, and wrote the two volumes on insects in the "Cambridge Natural History." In 1892 he became editor of the *Zoological Record*, and continued this work till his death. Dr. Sharp was a Fellow of the Royal Society, a Fellow of the Zoological Society, and a past president of the Entomological Society of London; he was also an honorary member of the Institute of New Zealand, and of the entomological societies of Washington, France, the Netherlands, and other countries.

Medical News.

PASTEUR COMMEMORATION FUND.—A sum of £848 14*s.* 6*d.* has been subscribed in this country to the fund, in addition to sums previously sent to France in response to earlier and direct appeals. In accordance with a resolution passed at a recent meeting of the Pasteur Commemoration Committee, presided over by Sir Charles Sherrington, a draft for the above amount is being forwarded to Monsieur Héring, the general treasurer, with an intimation that should the amount prove more than the French Committee desire to expend upon the monument, the excess should be devoted to some other form of permanent memorial of Pasteur in the University of Strasbourg. Prominent among the subscribers in the United Kingdom are the following firms: Messrs. A. Guinness, Son, and Co., Ltd. (£100); Messrs. Ansell's Brewery, Ltd.; Messrs. Barclay, Perkins and Co., Ltd.; Messrs. Mann, Crossman and Paulin, Ltd.; Messrs. Mitchells and Butlers, Ltd.; Messrs. Watney, Combe, Reid and Co., Ltd.; and Messrs. Whitbread and Co., Ltd. (each £50). The hon. treasurer of the fund in this country is Mr. A. Cheston Chapman, F.R.S.

FAIRCHILD SCHOLARSHIP AND PRIZES.—This scholarship was founded in 1904 by Messrs. Fairchild Bros. and Foster, of London and New York, in appreciation of the friendly relations between them and the pharmacists of the United Kingdom. The scholarship is open to any apprentice or assistant of either sex preparing to qualify under the Pharmacy Act, 1868, or the Pharmacy Act (Ireland), 1875. Candidates must be registered as "apprentices or students" of pharmacy. One scholarship of the value of £50, tenable for one year, will be awarded as the result of an examination in June, 1923, conducted simultaneously at London, Manchester, Cardiff, Edinburgh, and Belfast. (A grant is made of railway fare in excess of 5*s.* return.) In addition a prize of £5 will be awarded to each of the best candidates (not the winner of the scholarship) entering in England, Wales, Scotland, and Ireland. The Fairchild Scholar will be at liberty to select any well-known school or college of pharmacy; the money will be devoted to paying the fees and expenses, and what is over will be utilised for maintenance. No candidate must be less than 20 years of age on July 1st, 1923, or older than 22 on Jan. 1st, 1923. Birth and registration certificates are required. No student already qualified or holding another scholarship is eligible. The subjects of examination fall under the headings of elementary chemistry and materia medica, practical pharmacy and prescription reading, and elementary business knowledge. The scholarship and prizes are awarded by a committee of six trustees in Great Britain and Ireland. The secretary of the committee is Mr. Herbert Skinner, pharmaceutical chemist, 64, Holborn Viaduct, London, E.C., to whom candidates must give notice not later than June 1st, 1923, of intention to sit for examination.

MANCHESTER'S NEW M.O.H.—The Manchester Town Hall Committee decided on August 30th to recommend the city council to appoint Dr. Robert Veitch Clark, medical officer for the Borough of Croydon—a post which he has held for 11 years—as medical officer of health for the city in succession to Dr. J. Niven, who retired five months ago. Besides being a graduate in arts, science, and medicine of Edinburgh University, and holding the diploma of public health of Oxford, Dr. Clark acted for several years as a demonstrator and assistant in the physiological department of the University of Leeds, and in 1907 was resident medical officer at the Leeds City Fever Hospitals; from 1907 to 1913 he was assistant medical officer and chief sanitary inspector at Leeds, where he devoted much time to the organisation of schemes dealing with tuberculosis, maternity and child welfare, and school medical service, and the clearing of insanitary areas in the city. Dr. Clark was for a year lecturer on the hygiene of mines and miners in the University of Leeds. He has had wide experience in laboratory examination of those products which engage the attention of a medical officer of health and in work relating to infectious diseases generally; during the war he was responsible for the treatment of infectious diseases among the 67,000 men of the Royal Naval Division at the Crystal Palace and in several large military hospitals. There were 34 applicants under the revised conditions as to salary, from whom three were chosen for consideration at the final meeting of the committee, when Dr. Clark was selected. The salary will be £1700, rising by annual increments of £100 to £2000. The appointment is subject only to ratification by the city council.

SERBIAN MEDICAL SOCIETY.—This society, founded at Belgrade on April 22nd, 1872, is celebrating its fiftieth anniversary on Sept. 21st. The ceremony will take place in the great hall of the University of Belgrade at 9.30 A.M., when honour will be done to the Serbian medical men who fell in the war. After an address from the vice-president, the secretary of the society will give a brief résumé of its history. The afternoon will be devoted to visits to various sanitary institutions in the city and an official banquet at 9 P.M. concludes the day. Those who desire to participate should communicate with the Secretary, Dr. Bukic Piade, Kolarceva ul. 11, Belgrade, who will arrange for their entertainment.

CITY CHARITY ATHLETIC CONTEST.—Representatives from the Stock Exchange, Inter-Banks Athletic Association, insurance offices, and hospitals are competing in a charity athletic contest at Guy's Hospital Ground, Brockley Rise, Honor Oak Park, London, S.E., on Saturday, Sept. 9th, for a challenge shield presented by the *Financial Times*. In order that the entire proceeds from the sale of tickets may be divided between five great London hospitals—namely, St. Bartholomew's, Guy's, London, St. Thomas's, and King's College—without any deduction for entertainment tax, our contemporary has contributed a sum of money to cover the expenses of the meeting. Tickets, 1*s.*, 2*s.*, and 3*s.*, may be obtained from Mr. R. A. Lyons, St. Bartholomew's Hospital, E.C. 1, and the *Financial Times*, 72, Coleman-street, E.C. 2.

BOXING IN THE NAVY.—Surgeon Rear-Admiral Bett, who is in charge at the chief naval hospital at Haslar, near Portsmouth, speaking at a boxing display given in the hospital theatre by the sick-berth staff, after presenting the prizes complimented the staff on their good form. Boxing, he said, called out some of the best qualities in men and particularly in three directions: First it required men to keep fit, a solemn duty for every Englishman—the British race was the finest in the world, as had been proved in the past, and it is up to the younger generation to keep the race on top; secondly, boxing taught men to keep their tempers; and thirdly, never to get rattled in an emergency, a quality he would put first amongst those making for success in life. Anybody could get on all right when things went well, but it was the man who kept his head when things went wrong who was the real man. He was sorry they were losing C.P.O. Paine, physical and recreational training instructor, who is going to pension after nine months spent in improving the sick-berth staff at Haslar. He also thanked Commander Digby Bell, who, he said, had done more for the physical well-being of the Service than anyone else in it. It will be remembered that the fine building on the Spithead front of Haslar, which houses the sick-berth staff, was, like the same at Chatham, built by money subscribed at the commencement of the war by the women of Canada.

ROYAL SANITARY INSTITUTE.—The autumn courses of lectures and demonstrations, 1922, will be held as follows: An introductory lecture will be given to the students in the various courses by Dr. L. C. Parkes, Chairman of the Council of the Institute, on Monday, Sept. 25th, at 5.30 P.M. The sanitary officers' course will begin on Wednesday, Sept. 27th. Inspection and demonstrations are arranged, including visits to public and private works, illustrative of sanitary practice and administration, and routine of office work. Part I. of the course extends from Sept. 27th to Nov. 15th, and Part II. from Nov. 17th. to Dec. 1st. Fee for the complete course, £5 5*s.*; for Part I., £3 13*s.* 6*d.*, and for Part II., £2 2*s.* The course of practical training for meat and food inspectors begins on Friday, Oct. 6th. Students can also attend the lectures in Part II. of the course for sanitary officers. Fee for the two months' course, including lectures and demonstrations in Part II., £5 5*s.*; without Part II., £4 14*s.* 6*d.* The course for women health visitors and child welfare workers begins on Friday, Sept. 29th. The Institute has decided next year to require of all candidates for the examination for health visitors and school nurses three years' nursing training and the Central Midwives Board diploma, with attendance at a special course of training for health visitors. The fee for the complete course is £5 5*s.*, for Part I., £3 13*s.* 6*d.*, and for Part II., £2 2*s.* General information and notes for students are contained in the prospectus. Forms of application and all particulars can be obtained at the Institute, 30, Buckingham Palace-road, London, S.W. 1.

SMALL-POX AT BENTLEY.—An outbreak of small-pox has occurred at Bentley, Doncaster, and five cases were reported up to the week ending Sept. 2nd. All the schools and local picture-houses in the Bentley area have been closed.

NORTH-EAST LONDON CLINICAL SOCIETY.—The programme of the society for the 1922–23 session will open on Thursday, Oct. 5th, when Sir Archibald Reid will lecture on the X Ray Examination of the Pyloric End of the Stomach and its Vicinity. Subsequent lectures will be announced in our Diary columns. The annual dinner of the society will be held on Thursday, Oct. 12th, at the Prince of Wales's Hospital, Tottenham. The hon. secretaries of the society are Dr. J. S. Ferguson Weir, 1, Woodberry-avenue, Winchmore Hill, N. 21, and Dr. W. E. Tanner, 7, Cavendish-place, W. 1.

THE LATE DR. JOSEPH CARROLL.—Joseph Carroll, who died at Wigan in his sixty-third year, was educated at the University of Glasgow, graduating M.B., C.M. in 1882, and obtained the diploma of public health of Cambridge University in 1891. Dr. Carroll was at one time medical officer of health at Ilkeston, and during the war served with the 2/3 Welsh Field Ambulance, holding the rank of captain, R.A.M.C. (T.). He was an honorary life member of the St. John Ambulance Association, and at the time of his death was medical officer of the Wigan Union.

RADCLIFFE INFIRMARY, OXFORD: POST-GRADUATE COURSE.—From Oct. 2nd to 7th a post-graduate course of 12 lectures will be given. The mornings will be devoted to demonstrations of cases and specimens, and the first lecture will be delivered at 2.30 P.M., on Oct. 2nd, by Dr. W. A. P. Waters, on Rheumatism in the Adult and the Child. Subsequent lectures will be announced in our Diary columns. A dinner will be held in Queen's College Hall at 7.30 P.M. on Oct. 7th. The treasurer has arranged that a limited number of those attending the course may be accommodated in Queen's College. Early application should be made in writing to the Bursar, Queen's College. The fee for the course is £1 1s. for practitioners in the hospital area, and £2 2s. for members from elsewhere. Further particulars may be had from the secretaries, Dr. W. T. Collier and Dr. Hugh Whitelocke, at the hospital.

NATIONAL MILK CONFERENCE IN LONDON.—On Oct. 16th, 17th, and 18th a conference convened by the National Clean Milk Society, Inc., will be held (by permission of the Corporation of the City of London) in the Council Chamber of the Guildhall, E.C., under the presidency of Viscount Astor. The programme will be briefly as follows: Oct. 16th, 10 A.M., inaugural address by the President. Morning session: Chairman, Sir Arthur Griffith-Boscawen, Minister of Agriculture; papers, Breed of Cattle in Relation to Quantity, Chemical Composition, and Cost of Milk Production, by Mr. James Mackintosh, and the Effect of Feeding of Dairy Cattle in Relation to the Cost of Milk Production, by Mr. G. H. Garrad. Afternoon: Chairman, Mr. Wilfred Buckley; papers, Contagious Abortion and other Diseases of Cattle, by Sir Stewart Stockman, and the Production of Clean Milk, by Mr. F. Arnold Lejeune.—Oct. 17th, morning: Chairman, Sir Alfred Mond, Minister of Health; papers, Bovine Tuberculosis and its Relation to Man, by Dr. A. Stanley Griffith, and the Tuberculin Tests, by Captain S. R. Douglas. Afternoon: Chairman, Viscount Elveden; papers, Variation in the Chemical Composition of Milk, by Mr. Charles Crowther, Ph.D., and Handling and Distribution of Milk, by Mr. John Robertson.—Oct. 18th, morning: Chairman, Sir Walter Fletcher; papers, Pasteurisation and other Methods of Treating Milk, by Prof. Georges Dreyer and Dr. Charles North (New York). Afternoon: Chairman, Sir George Newman; papers, the Food Value of Milk and its Care in the Home, by Dr. Robert Hutchison, and Education of the Public and of the Dairy Industry in Regard to Milk, by Sir A. Daniel Hall. The discussions following these papers will be opened by Lord Bledisloe, Mr. R. H. B. Jesse, Mr. H. Tudor Hughes, Dr. R. Stenhouse Williams, Dr. Nathan Raw, M.P., Mr. G. P. Male, Mr. G. W. Monier Williams, Ph.D., the Right Hon. F. D. Acland, M.P., Dr. Eric Pritchard, Dr. Leonard Hill, and Prof. H. R. Kenwood. Twenty-six societies and associations are supporting the National Clean Milk Society, including the British Medical Association, the Royal Institute of Public Health, the Royal Sanitary Institute, the National Veterinary Medical Association, the Society of Medical Officers of Health, the Sanitary Inspectors' Association, various bodies which deal with child welfare, and numerous cattle societies and milk producer's associations. The fee for membership in the conference is £1 1s. for members of any society or association supporting the conference, and £1 5s. for others. Non-members of the conference who desire to be present at any or all sessions can obtain tickets by filling up an application form. Inquiries should be made to Miss H. M. Willans, hon. secretary, National Milk Conference, 3, Bedford-square, London, W.C. 1.

THE office of the Official Medical History of the War has been moved from Stanhope House, Kean-street, Drury-lane, to Imperial House, Tothill-street, Westminster, London, S.W. 1, Rooms 79c, 80, 81, and 82 (fifth floor).

HOSPITAL REUNION.—The annual dinner of the past and present students of *St. Mary's* Hospital Medical School will be held at the Connaught Rooms, Great Queen-street, London, W.C. 2, on Monday, Oct. 2nd, at 7 for 7.30 P.M. The chair will be taken by Sir Leonard Rogers, F.R.S. The secretary is Mr. A. Hope Gosse, 15, Queen Anne-street, London, W. 1.

THE JUNIOR RED CROSS.—On a recent visit to Norwich, during which he distributed medals to members of the Red Cross Society, Sir Claude Hill, director-general of the League of Red Cross Societies, invited a study of the documents dealing with the Junior Red Cross movement, in order to see whether its special features might not be applicable in Norfolk. He wished to correct the impression that the Junior Red Cross was in any way antagonistic to the boy-scout and girl-guide movements; rather it was complementary and supplementary to them. The programme of the Junior Red Cross was essentially an educational one: it was concerned with the teaching of certain aspects of civic responsibility within the school, and largely at the discretion of the teacher. The history and aims of this movement have recently been fully dealt with by Sir Philip Gibbs in his book on America entitled "People of Destiny." The writer there mentions that of the 23,000,000 scholars in American public schools more than 13,000,000 were enrolled as members, while some 165,000 teachers were associated with the work.

Appointments.

EELES, JESSIE, M.B., Ch.B. Edin., has been appointed Resident Medical Officer at the Ida and Robert Arthington Hospitals, Leeds.

MCKENZIE, H., M.B. (of Cannock Chase Ministry of Pensions Hospital), Resident Surgical Officer at Ashton-under-Lyne Infirmary.

SMITH, J. W., F.R.C.S. Eng., Honorary Consulting Surgeon to the Manchester Royal Infirmary.

WRIGLEY, P. R., F.R.C.S. Eng., Honorary Surgeon to the Manchester Royal Infirmary.

Manchester Royal Infirmary:—Resident Medical Officer (Central Branch): SANDISON, DOROTHEA, M.B., Ch.B. Glasg. Senior House Surgeons: MARTLAND, W. L., M.B., Ch.B. Manch.; GERAGHTY, W., M.B., Ch.B. Manch.; CRAIG, N. S., M.B., Ch.B. Manch.; DUTHIE, O. M., M.B., Ch.B. Manch.; BUCKLEY, G. H., M.B., Ch.B. Manch. Senior House Surgeon (Specials Department): BROWN-HENDRY, J., M.B., Ch.B. Edin. House Surgeon (Specials Department): FAY, H. P., M.B., Ch.B. Manch. House Physicians: ABBATT, P. D., M.B., Ch.B. Manch.; ANDERTON, R., M.B., Ch.B. Manch.; STRUTHERS, J. H., M.B., Ch.B. Manch. House Surgeons: INGHAM, A., M.B., Ch.B. Manch.; BENNETT, J. H., M.B., Ch.B. Manch.; SCOTSON, F. H., M.B., Ch.B. Manch.; ROSENSTONE, A., M.B., Ch.B. Manch.; BAILEY, K. V., M.B., Ch.B. Manch.

Certifying Surgeons under the Factory and Workshop Acts: BROWN, A. L., L.R.C.P. & S. Edin., Glasgow (South) District of the County of Lanark; SCOTT, L. B., Blandford District of the County of Dorset.

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne Union.—Med. Supt. £450.
Ayr County Hospital.—Res. H.S. £175.
Barrow-in-Furness, North Lonsdale Hospital.—H.S. £225.
Barry Urban District Council, &c.—S. £750.
Bedford County Hospital.—H.S. £200.
Bradford Royal Infirmary.—Two H.S.'s. £200.
Buxton, Derbyshire, Devonshire Hospital.—H.P. £200. Also Asst. H.P. £150.
Cambridge Mental Hospital, Fulbourn, near Cambridge.—Sen. Asst. M.O. £400.
Cardiff, King Edward VII. Welsh National Memorial Association.—Asst. Res. M.O. £300.
Carlisle, Cumberland Infirmary.—Res. M.O. £175.
City of Westminster Union Infirmary, 369, Fulham-road, S.W.—Second and Third Asst. M.O.'s Each £300.
Derby County Asylum.—Med. Sup. £1000.
Dumfries and Galloway Royal Infirmary.—Sen. Res. M.O. £175.
Eastbourne, Princess Alice Hospital.—Res. H.S. £175.
East Ham Municipal Maternity and Child Welfare Dept.—M.O.
Edinburgh Royal Infirmary, Eye Dept.—Sen. Clin. Asst., &c. 145 guineas.
General Lying-in Hospital, York-road, Lambeth, S.E.—Res. M.O. £100.
Grantham, Lincs., Ministry of Pensions Hospital, Harrowby Camp.—Jun. M.O. £350.
Gravesend Hospital, Kent.—H.S. £200.
Hackney Union Infirmary.—Two Jun. Asst. M.O.'s. £334.
Hereford Victoria Eye and Ear Hospital.—Hon. Opth. and Aural Surg.

Hospital for Diseases of Skin, Blackfriars-road.—Clinical Asst.
Hull Royal Infirmary.—Asst. H.S. £150.
Islington Dispensary, 303, Upper-street, N.—Res. M.O. £300.
Lancaster County Asylum.—Asst. M.O. £300.
Leeds General Infirmary.—Res. M.O. £200.
Maidstone, West Kent General Hospital.—H.S. £220.
Montrose Royal Asylum.—Asst. Med. Officer. £300.
Newport, Mon., Royal Gwent Hospital.—H.S. £180.
Northampton, St. Andrew's Hospital for Mental Diseases.—Second Asst. M.O. £400.
Prince of Wales's General Hospital, Tottenham, N.—H.P. and H.S. Each £200. Jun. H.S. and Jun. H.P. Each £120.
Queen Charlotte's Lying-in Hospital, Marylebone-road, N.W.—Dist. Res. M.O. £80.
Queen Mary's Hospital for the East End, Stratford, E.—Res. M.O. £300.
Rochester, St. Bartholomew's Hospital.—H.P. £200.
Royal Chest Hospital, City-road, E.C.—H.P. £120. Res. M.O. £200.
Royal Free Hospital, Gray's Inn-road, W.C.—First and Second Assts. to M.O. £200 and £100 respectively. Also Med. Reg. £250.
Royal Northern Hospital, Holloway, N.—H.P. £150.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.S. £100.
St. Bartholomew's Hospital Medical College.—Dem. of Mid.
St. George's Hospital, S.W.—Radiologist. £100.
Sheffield University.—Dem. in Path. and Bact.
Tunbridge Wells General Hospital.—H.S. £160.
Wallasey County Borough.—Asst. M.O.H. £700.
West London Hospital, Hammersmith-road, W.—Non. Res. Cas. O. £5 5*s.* per week. Also H.P. and Two H.S.'s. £100 each.
Westminster Hospital, Broad Sanctuary, S.W.—Asst. H.P. and Asst. H.S. Each £52. Also Med. Reg. and Cas. M.O. £150.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointment: Alva (Clackmannan).

Births, Marriages, and Deaths.

BIRTHS.

CRAIG.—On August 21st, at St. Margaret's, Privett-road, Alverstoke, the wife of Surgeon-Commander John W. Craig, Royal Navy, M.B., C.M. Ed., of a daughter.

MCCULLOUGH.—On July 4th, at the Provincial Mental Hospital, Ponoka, Alberta, Canada, Dr. Mary McCullough, the wife of Dr. David Louis McCullough, of a son.

WACHER.—On August 25th, at St. George's-place, Canterbury, to Nell, wife of H. Stewart Wacher, M.R.C.S.Eng., L.R.C.P. Lond., of a daughter.

MARRIAGES.

HEATH—HARRISON.—On August 31st, at St. Alkmund's Church, Derby, George Edwin, Surgeon Lieut.-Commander, R.N., M.R.C.S.Eng., L.R.C.P.Lond., to Alice Evelyn, daughter of Mr. and Mrs. J. Thornton Harrison, Derby.

HOLMES—BEALES.—On August 16th, Arthur Hillyard Holmes, M.D., M.R.C.P., eldest son of Mr. and Mrs. A. E. Holmes, of Manley-road, Whalley Range, Manchester, to Hilda, only daughter of the late Mr. Henry Beales and Mrs. Beales, of Alexandra Park, Manchester.

DEATHS.

COLLINGWOOD.—On Sept. 2nd, at Osborne, Isle of Wight, Surgeon Rear-Admiral Collingwood, C.B., M.V.O.

DONELAN.—On August 25th, suddenly, James Donelan, M.B., M.Ch. R.U.I., Chevalier of Crown of Italy, of Manchester-square, W., and Bruntsfield, Harrow, aged 65.

HAYWOOD.—On August 31st, at Officers' Hospital, Brighton, after long and painful illness, Lieut.-Colonel Lewis Haywood. R.A.M.C., retired, M.B., C.M.Aberd.

LYNDEN-BELL.—On Sept. 1st, at Millbank Hospital, Colonel Edward Horace Lynden-Bell, C.B., late R.A.M.C., M.B., C.M.Ed.

MACDONNELL.—On August 31st, at Keith House, Villiers-road, Southsea, Inspector-General Henry Macdonnell, C.B., R.N., retired, L.R.C.P. & S.I., aged 83.

RYALL, SIR CHARLES, C.B.E., F.R.C.S., of 62, Harley-street, W.1, suddenly, at Dornoch.

SHARP.—On August 27th, at Lawnside, Brockenhurst, David Sharp, M.A., M.B., C.M.Ed., F.R.S., F.Z.S., aged 81 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
ABROAD	One Year	£2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

Subscriptions may commence at any time and are payable in advance. Cheques and P.O.'s (crossed "London County Westminster and Parr's Bank, Covent Garden Branch") should be made payable to THE MANAGER, THE LANCET Offices, 423, Strand, London, W.C. 2.

Notes, Short Comments, and Answers to Correspondents.

THE WELFARE OF THE BLIND.

THE recently published report of the executive council of the National Institute for the Blind, covering the year ended March 31st, 1922, contains a detailed account of the numerous activities of the Institute, which now relate to all ages and classes of the blind population. The introduction to the report contains a good résumé of the origin and development of the Institute, and a tribute to the late Sir Arthur Pearson and his work. The policy of coöperation with other institutions for the blind has been justified by the financial results and by the close relationship now existing between these organisations. Grants amounting to over £40,000 were made during the year by the Institute to local institutions for the blind throughout the country. The Greater London Fund for the Blind, administered by the National Institute with the assistance of an advisory committee of representatives of the other institutions, had distributed the sum of £20,800 up to the end of the period dealt with in the report.

From the first few months of its establishment, Sunshine House, the home at Chorley Wood, Herts, for babies under 5 years of age, has always been full, with a long waiting list. It is felt that the establishment of a similar home in the north of England will greatly assist the solution of the problem of the blind baby. During the year the sum of £4911 was allocated to Worcester College for Blind Boys; the opening of the Cedars, a beautiful country house at Chorley Wood, Herts, the gift of Mr. J. H. Batty, as a college for blind girls, arose out of a recommendation of the Departmental Committee on the Welfare of the Blind, the report of which was issued in July, 1917. These two colleges are successfully raising the standard of education and status in after-life of blind students.

The editorial and publishing department of the Institute has this year been prevented by lack of funds from equalling last year's output, but the numbers of books embossed was large, and ample allowance is always made for different tastes and requirements. In addition to books, 14 Braille magazines and newspapers, one magazine in Moon type, and a letterpress magazine, the "Beacon," devoted to the welfare and interests of the blind, are published. The *Braille Mail*, a weekly newspape r giving a day-by-day summary of the world's news, is perhaps the only true newspaper in the world, in the strictest sense of the term, for all news is given without editorial comment. The manuscript department supplies books of an educational or special character to blind students training for the professions; 57 living blind students at present hold University degrees. Every endeavour has been made during the past year to continue as far as possible all the activities of the music department. A considerable output of Braille music has been maintained; the music for standard examinations has been much in demand, and the organ in the Armitage Hall of the National Institute is always available to students who wish to practise for the examinations of the Royal College of Organists.

Up to the present time 152 students have been trained for the recognised massage examinations, and have all successfully qualified; the majority of them have also passed the examination in remedial gymnastics and the medical electricity examination. During the course substantial financial help is rendered by the Institute in respect of students' maintenance, fees, text-books, and services of a guide. A special library of massage literature is at the free disposal of students and graduates, the librarian being himself a blind medical man trained in massage under the auspices of the Institute. Through the after-care section of the department suitable posts are secured for students after qualifying, and in a number of instances apparatus necessary for the treatment of patients has been supplied. The Institute has trained as masseuses three hospital nurses, two of whom lost their sight whilst engaged in military hospitals during the war, and have now been settled in hospital posts; the third has started in private practice. In the home teaching department, 36 teachers (all blind save one) have visited 5512 people, including the blind in workhouses and infirmaries. The number of new cases dealt with during the year was 963, making a total now on the Institute's register of 7039 cases. A sum of £11,371 17*s.* 4*d.* was distributed in relief to necessitous cases. Gifts to the value of £989 5*s.* 9*d.* were provided, and dental and surgical requisites supplied to 35 people. The after-care department is also responsible for 140 persons who are being educated or who are undergoing training in industrial and professional occupations. Educational fees paid during the period under review amounted to £1250 10*s.*, and training fees to £3492 7*s.* 11*d.*

The serious diminution of funds with which the National Institute was faced almost from the beginning of the period under review caused very grave anxiety; every possible reduction in expenditure was effected, without reducing the number—namely, 332—of blind persons employed by the National Institute and its branches, nor the salaries and wages paid to them, amounting during the year to nearly £55,000. We cordially endorse the earnest appeal for additional funds to all those interested in the work of the National Institute and in the welfare of the blind.

THE CINÉOJOUR.

THE invention of the Cinéojour, or daylight cinematograph, marks a new development in the method of presenting motion pictures. A private press demonstration was given on Tuesday, Sept. 5th, at which the inventor, Mr. Ernest Bertron, was present. The demonstration took place in the open air in private grounds near Hendon, and the afternoon being particularly bright and sunny the invention was subjected to a severe test. The hitherto insurmountable difficulties of presenting a sufficiently brilliant picture, while at the same time excluding all outside light from the screen, have apparently been successfully overcome; the pictures were projected with complete clearness and brilliance, a slightly stereoscopic effect being obtained in addition. The apparatus itself is constructed in such a manner as to absorb any light that may come from the sky or from surrounding objects, while preventing its reflection upon the screen. The screen is placed at the back of the stage instead of as usual at the front, the pictures being projected from behind.

The advantages of an exhibition that can be given in the open air, or in broad daylight in an ordinary hall, are obvious.

SOCIAL LEGISLATION IN CZECHO-SLOVAKIA.

IN a new edition of "The Czecho-Slovak Republic,"[1] a handbook prepared by MM. Jaroslav Cisar and F. Pokorny to familiarise English readers with the history, geography, politics, economics, and culture of Czecho-Slovakia, we look in vain for more than the briefest reference to medicine, but a short account is given of social legislation which, it is claimed, averted many difficulties during the establishment of the new State. The accident and sick insurance in force before the war has been extended, and maternity insurance is included in the latter. The Ministry of Social Welfare has provided from the beginning of the Republic for pensions for war invalids, for the disabled, and for widows and orphans. The number of the latter alone is estimated at more than 300,000, and the annual grants made to the disabled amount to over 800 million crowns. One of the first laws passed by the revolutionary National Assembly established an eight hour working day which conforms fully with the resolutions later drawn up by the International Labour Bureau. All "home industries"—i.e., those carried on in private dwellings—are subject to the control of special commissions. Several organisations participate in work for the protection of women and children, among them being the Czecho-Slovak Red Cross, which has been transformed from a war to a peace organisation. With regard to housing measures, a law prohibiting unjustifiable absence from home or unjustifiable removal into districts already overcrowded remains in force on account of the housing shortage, which has also led the Government to requisition unused dwellings. The Ministry of Social Welfare encourages building enterprise by State bonuses and guarantees; grants made in this connexion during 1920 amounted to 300 million crowns.

HOMES FOR INEBRIATES ASSOCIATION.

THE report for the year ending Jan. 31st, 1922, of the Homes for Inebriates Association contains the balance-sheet of the Association, the annual report by Dr. F. S. D. Hogg, medical superintendent of Dalrymple House, Rickmansworth, and an appendix giving particulars of 1565 patients discharged from that institution "during a period extending over many years." Dr. Hogg records 79 admissions during the year under review; 17 patients were admitted under the Inebriates Act, the remainder being private patients. Applications for admission of drug addiction cases have demonstrated the benefit of the Dangerous Drugs Act to this class of patients, who have found it difficult and even impossible to obtain supplies. During the last two or three years there has been a noticeable alteration in the character of symptoms consequent on excessive, and sometimes of comparatively moderate, spirit-drinking among alcohol patients; early excitement, slower recovery, and an increased tendency to partial blindness are more frequent. Dr. Hogg believes this alteration to be due to the toxic effects of inferior liquor, and possibly to the addition of wood (methyl) alcohol to some of the spirits now placed on the market; he has been informed by persons in the liquor trade that inferior whisky is being imported into the country, and that it would be better for the public if the release from bond were allowed, for a time, of home-made whiskies at an earlier date than is now legal, as such whiskies, although perhaps immature, would be of purer quality than the imported varieties. Seventy-nine patients were discharged during the year; of these, 7 left on account of urgent private affairs, 1 was transferred elsewhere on account of ill-health, 2 were unsuitable for treatment, and in 4 cases further residence was considered unnecessary. The average length of stay during the year was 13 weeks, as compared with a general average, quoted in the appendix, of 21 weeks. The general health of the patients has been excellent. Included in the appendix are the following rough percentages relating to the after-histories of 1565 patients treated at the institution: Doing well, 40; improved, 6; not improved, 22; insane, 2; no news obtainable or dead, 22; discharged unsuitable for treatment or transferred elsewhere, 6. Re-admissions numbered 175. Drinking habits were "regular" in 1054 cases, and "periodical" in 465. Ordinary habits are described as social in 1492 patients, and solitary in 73.

AN IMPROVED AERO-URETHROSCOPE.

IN a little pamphlet of 22 pages (John Bale, Sons and Danielsson, Ltd., 1922, 2*s.* 6*d.*) MR. W. Wyndham Powell, F.R.C.S., formerly for many years chief clinical assistant to St. Peter's Hospital for Stone, describes a new pattern urethroscope which he has invented. There are a number of improvements, the chief of which is the omission of the rather awkward collapsing mount of the older instruments, in favour of a much more convenient and practical arrangement. The new urethroscope gives fresh evidence of the author's ingenuity and inventiveness.

OLPENAPNEU TREATMENT.

WE note in the current number of the *Münchener Medizinische Wochenschrift* that an official bulletin to the following effect has been issued by the Prussian Ministry of Health:—

"'Olpenapneu, Dr. Martin Olpes Toko-Marah G.m.b.H.' is the name given to an undertaking in Düsseldorf which has occupied for nearly a year the attention of the authorities in the districts of Düsseldorf and Cologne, and now seeks to extend its sphere of action into wider districts. The undertaking treats, at dispensaries conducted by doctors or lay persons, with Toko-Marah and Olpenapneu, asthma, lung, and related troubles. Martin Olpe is not a doctor but is reputed to have obtained a degree of Dr.Litt. in America. Frau Elisabeth Olpe has studied medicine and passed the State examination but has not been registered and does not possess the right of calling herself doctor of medicine. By means of advertisement, the licence to carry out the cure and to set up dispensaries is being offered for large sums of money. The danger exists that uninformed persons may be harmed."

SALARY STANDARDS FOR HEALTH OFFICERS IN THE UNITED STATES.

THE salaries at present paid to health officers in America are not commensurate with the scientific training, personality, and professional responsibility required. This is the main conclusion of a Committee on Salary Standards, whose report appears in the August number of the *American Journal of Public Health*. The Federal Government sets a bad example in this respect; thus the surgeon-general of the Public Health Service has a maximum pay and allowances of $7500, and an assistant surgeon in his department of $3226. The largest salaries of Executive State medical officers are given in Pennsylvania ($10,000), New York ($8000), and Massachusetts ($7500). The average salary of a health officer in all the States is only $4450, or about $4·35 per 1000 of population. Of 46 States, in 38 the salary ranges between $3000 and $4800. In counties and municipalities the salaries are usually on the lower scale shown above. The city health officers of Philadelphia and Chicago receive $10,000, of New York, Detroit, San Francisco, and Boston $7500, but the average is much lower than this. Even less satisfactory than the position as regards salaries is the tenure of office of health officers. There is still need for extension of the system under which political conditions are excluded. The Committee recommend that a minimum salary of $5000 should be given to every full-time qualified State health officer, and that in suitable cases this salary should be increased to double the amount named. They also recommend that no other full-time health officer for a population exceeding 10,000 should receive less than $3000; and that the salaries of qualified chiefs of divisions in municipal health departments should receive approximately three-fifths of the salaries of their chiefs.

Dr. Richard T. Smith, consulting physician to the Soho Hospital for Women, has celebrated his golden wedding.

[1] London: T. Fisher Unwin. 9*s.* net. Prague: Orbis Publishing Co.